AUGUST 1961

FOOD ENGINEERING

A CHILTON PUBLICATION

FOR BETTER MANAGEMENT IN MANUFACTURING

FDA Plays It by Ear p. 31

Microwave Freeze-Drying p. 34

Crystalline Cellulose: New Ingredient p. 44

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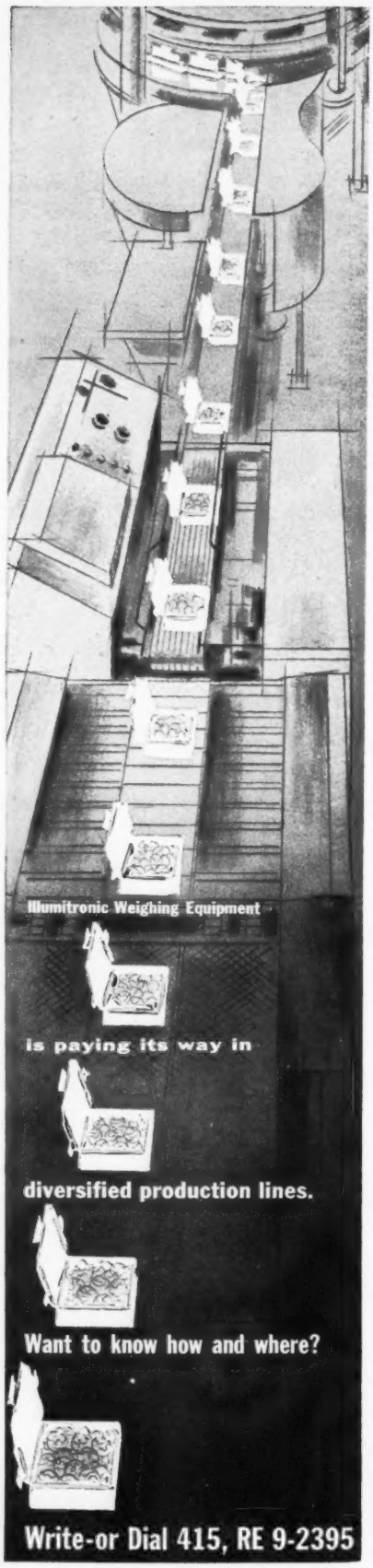
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CIRCLE 2 ON INQUIRY CARD

FOOD ENGINEERING
FOR BETTER MANAGEMENT IN MANUFACTURING

VOL. 33 NO. 8

August, 1961

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Carla Williams

EXCLUSIVE

FE Quizzes FDA Consumer Chief

Field consultants give your consumers a direct line to agency. Their reports show women are aroused by certain trends in packages, products, additives.—p. 31.

ONE OF A SERIES OF CHATS ABOUT CONSERVATION AND CONTROL OF HEAT

SARCO TOPICS

PROBLEMS OF PRECISE TEMPERATURES IN WINE PASTEURIZATION

It's a shame that so many people think you throw grapes in a vat, press them, bottle the juice, and just wait a while to create wine. Even those who pride themselves on their knowledge of wines are seldom aware of the artful engineering required. Pasteurizing wine is actually much more delicate and tricky than pasteurizing milk.

Take temperatures. Wine must be pasteurized at 140°F. And spoilage can cause economic havoc. Those are the facts of life in the world of wine. They might not seem too difficult to live with unless you're in the wine or food processing business. Then you probably know how tough things can get when you have a rendezvous with a thermometer.

Take New York's Monarch Wine Company, producers of Manischewitz Wines. Their Problem: how to maintain the 140° temperature in the heat exchangers despite wide variations in the rate of wine flow. These variations, between 5 to 60 gallons per minute, result from slowdowns and recoveries in the bottling process. Problem: entire system must be capable of complete shutdown when necessary. Problem: wine temperatures must be raised to 140° as rapidly as possible, sometimes an immediate jump of 100°.

Attracted perhaps by aspects of the situation that had little to do with pure science, Sarco engineers applied the collective experience of Sarco technology to the solution of this serious problem. The result for Monarch: the *degree of control* the process demanded—achieved through the excellent use of Sarco Temperature-Pressure Regulators, Float Thermostatic Steam Traps, Thermo-Dynamic Steam Traps, and Pipeline Strainers.

Sarco engineers, ever resourceful, divided each of the two large Cherry-Burrell plate-type heat exchanger units into two separate sections with a blank baffle plate, each with a separate Sarco control. Thermal sensing bulbs were installed in wine discharge and throttling controls hooked into steam supply. As demand

fluctuates, one or both regulators function to maintain the 140° temperature. In higher demand, both regulators are operative; as demand drops and flow decreases, only one regulator supplies steam. Pasteur himself would have been elated.

Each of six smaller capacity shell-and-tube heat exchangers required only one regulator, with sensing bulb inserted into the outlet side of the wine filled shell, and the regulator throttling steam supply to the tube section. Thus, by controlling flow of steam to the exchangers on the basis of pressure and temperature, the Sarco regulators were able to maintain the temperature of the wine at precisely 140° regardless of fluctuations in demand or supply rate. Whew! A lot of engineering went into those two sentences.

From here on it's downhill. To secure complete cut off of the steam supply during scheduled shut-downs of the bottling run, solenoid valves were provided to supplement normal modulating action of the controls. To discharge widely varying loads of condensate continuously and remove immediately all air and incondensible gases, Sarco Float Thermostatic Steam Traps were installed on all condensate outlets. On the drips before each control valve a Sarco Thermo-Dynamic Steam Trap was installed to insure delivery of dry steam. Sarco Pipeline Strainers were installed before all steam traps and valves to protect them against damage by any foreign bodies. And thus ends a classic story of the grape.

Still, this story has been condensed far too much, really, and we feel you've been cheated out of the story's more delicious details. You needn't be, however. We've printed the facts in detail for posterity and you in Sarco Case History 185, complete with drawings that practically make it a do-it-yourself kit. If you would like a copy, we will be flattered to receive your request, and dispatch it with dispatch.

WE'RE ALWAYS IN . . . AND THE WELCOME MAT'S OUT

We always take it for granted that if you are going to be in the vicinity of our plant you'll phone or drop us a line so we can invite you to visit us. You'll find that our factory in Bethlehem, Pennsylvania, is on many well-travelled routes, and that our steam laboratory has much to offer in interest and helpfulness.

Forgive us for being immodest, but the lab is the most up-to-date of its kind in the country.

When you visit us, don't allow yourself to get sidetracked by the drill presses and automatic lathes. We're proud of this equipment but you've probably seen metal mutilated before, and it's our steam laboratory that's unique. We promise you a good show, and if you have any problems, bring them along. We'll solve them while you wait.

ANYONE FOR KEY CHAINS?

We seem to have these key chains. Want one? They're much more convenient than a case. A tiny replica of a Sarco Thermo-Dynamic Steam Trap, Type TD-50 is attached, but you can always remove it if you find it too commercial. There must be many things you could use these chains for. Fishing sinkers? Lengthening a light cord, maybe? Anyway, if your Sarco Representative is out, write in.

Pardon our monopolizing the conversation in this series of paid communiques, but we're trying our best to interest you in certain subjects that concern us both—to the point where you'll communicate.

5900

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SARCO COMPANY, INC.
635 MADISON AVENUE, NEW YORK 22, N. Y.
PLANT: BETHLEHEM, PA.

STEAM TRAPS • TEMPERATURE CONTROLLERS
STRAINERS • HEATING SPECIALTIES

CIRCLE 118 ON INQUIRY CARD FOR MONARCH CASE HISTORY 185

CIRCLE 4 FOR KEY CHAINS

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fmc

CONTINUOUS BEAN SNIPPER

A rugged, precision-built machine for capacities up to 1500 pounds per hour

This quality FMC machine is precision engineered in every detail. It's designed to operate under continuous heavy-duty conditions at extremely low cost. It has been thoroughly tested and proved, now incorporates additional refinements that make it one of the most valuable items of equipment in any green or wax bean processing operations. Here are some of the Snipper's unique features:

• Stainless steel drum for long life • Oscillating system for chevron knives gives even drum and knife wear • New, long-wearing, quick snap-in knives reduce maintenance • Safety release and automatic knife reset prevents damage, improves efficiency • Chain-driven oscillating system provides clean-cut shearing action • Duthane faced trunnions for quiet operation • Sanitary, easy to clean with steam or water • Large throat opening prevents bridging • Adjustable throat gate regulates product flow for maximum snipping efficiency.

Write for full information and literature, or ask your FMC representative to call.

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

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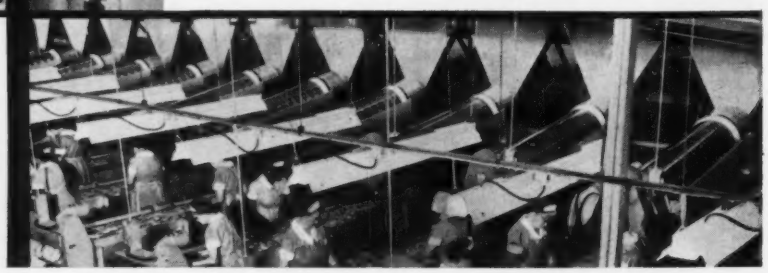
WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.



Battery of FMC Snippers handles high continuous volume of whole beans at **NORTHWEST PACKING CO.** plant in Portland, Ore. Closeup view above shows compact arrangement of Snipper and inspection table for maintaining quality control.

TRENDS & FORECASTS

Freeze-dry equipment manufacturers have sold more than 60 lab and about 70 production units in U. S., Western Europe, South Africa and Australia. About half of lab and 40% of production units are in U. S.

Freeze-dried shrimp sells at about same price as green frozen shrimp. Several tons a day is produced for institutional market at San Carlos, Texas, plant of United Fruit.

Expenditure for new plant and equipment by food and beverage manufacturers is placed at $1.1 billion annual rate for 3rd quarter by Dept. of Commerce. This is 16% higher than year earlier.

Heat-in-pouch frozen foods represented 100 million unit business in '60, up 45%. Forecast is 300 million for '65. There are 43 packers, 100 products.

Trend to better eating abroad is reflected in these one-year increases in ice cream products: Belgium, 50%; Netherlands, 28%; Denmark, 25.5%; Norway, 25%; West Germany, 23.5%; Ireland, 20.4%; United Kingdom, 10%; New Zealand, 9.7%; Italy, 7%; Australia, 0.9%; Japan, 42.4%; Costa Rica, 25%; Venezuela, 10.6%.

Instant nonfat dry milk was big hit at Paris Trade Fair, USDA reports. About 9,000 U. S. packages were sold in 7 days.

There is potential 2 billion quart market for fresh-tasting canned concentrated milk, according to survey reported by U. S. Steel.

Canned asparagus exports increased 69% in '60; soups, 62%; apricots, 36.5%; spinach, 34.5%; peaches, 32%; fruit cocktail, 14.6%; single-strength orange juice, 21.5%.

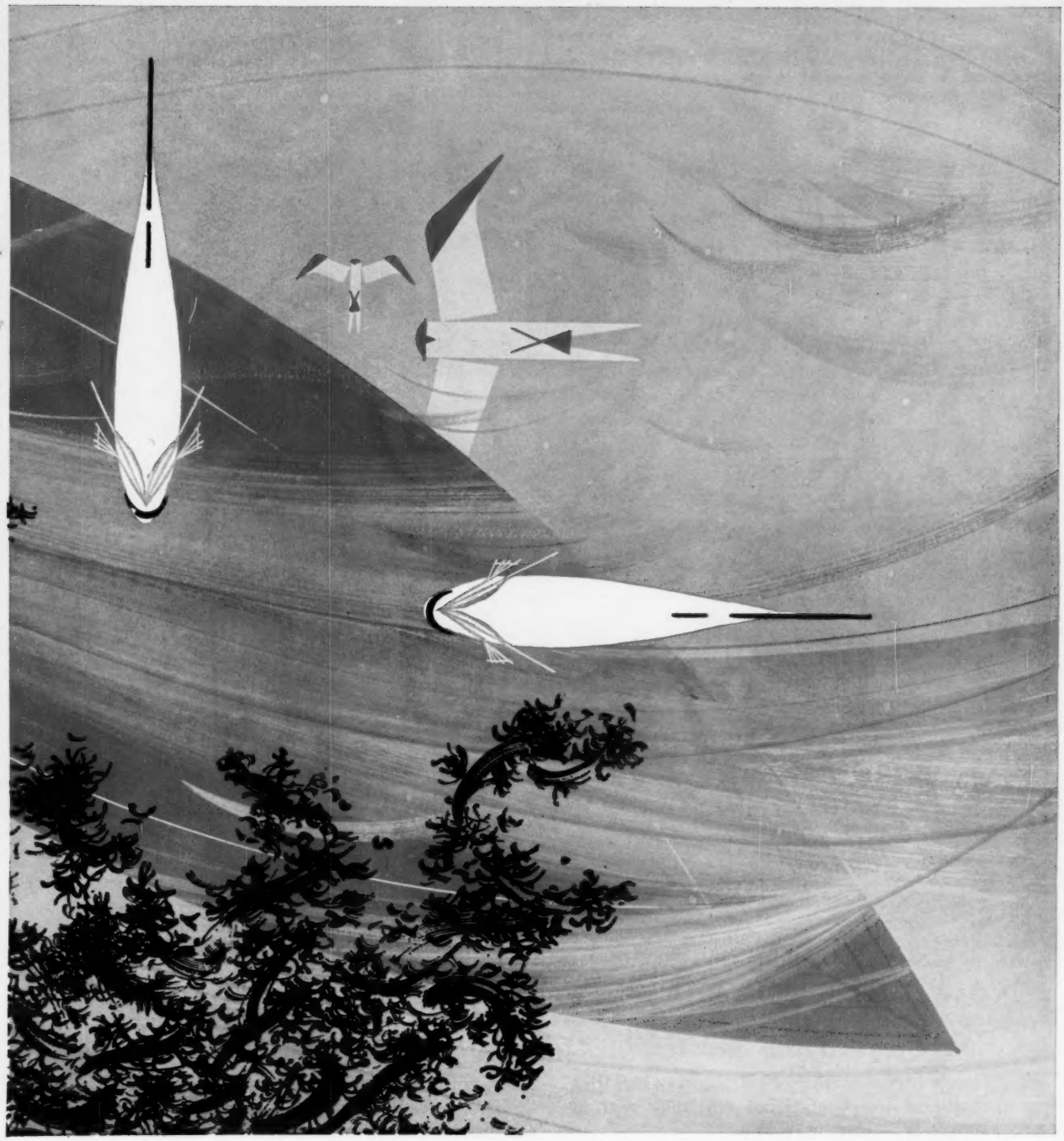
Canned shrimp exports gained 21% last year, but total canned fish shipments were down 52%. Canned poultry was up 32%.

Durum wheat crop is down 52% from last year to 16.5 million bu. because of drought. Other spring wheat, 126 million bu., smallest since '36. Winter wheat, 1,116 million bu., up 1%.

Florida citrus processors packed 83.8 million gal. of frozen orange juice concentrate in '60-'61 season, up 7.4%.

Pack of spring spinach in California is up 2.9% to 3 million cases. Pineapple pack is 20.9 million cases, 4.7% higher. Pineapple juice, 13 million cases, 8.6% gain.

A MIRACULOUS STABILIZER OF INFINITE USES—Beneath the pounding surf off the rugged coasts of Maine and Nova Scotia, grows a plant the fishermen call "Irish moss." For centuries Irish moss was "just another seaweed." Yet today this plant is raked from the cool ocean floor, dried by the sun and specially processed by Kraft under conditions of maximum sanitation, to produce an extremely effective natural stabilizer known as Kraystay. In essence, Kraystay is the edible extract of Irish moss, a natural gum that functions to: Stabilize—Emulsify—Suspend—Thicken—Gel. Every reason why, if the products you make incorporate a stabilizing, emulsifying or thickening agent, you should investigate the economy and consistent performance offered by versatile Kraystay. In new product development, Kraystay can play a vital role, too. And if you use a thickener—



Kraystay's special properties can help you produce a smoother, more consistent product, one with better "mouth feel." Remember, Kraystay is easily dispersed in cold water and goes completely into solution at 165 degrees. The coupon below will get you the complete story of Kraystay from Kraft.

KRAYSTAY vegetable stabilizer by **KRAFT**

Kraft Foods Industrial Division E-8
500 Peshtigo Court, Chicago 90, Illinois

Please send me more information on Kraystay.

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

CIRCLE 9 ON INQUIRY CARD

FULLY DEVELOPED VOLUTE PUMP HEAD

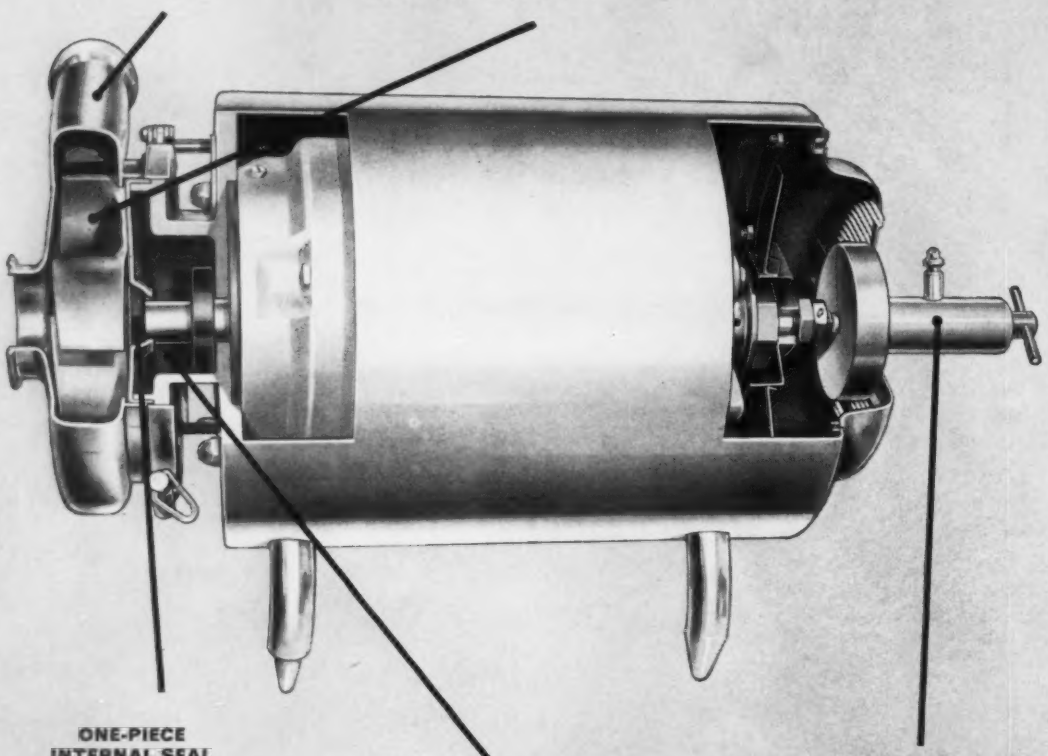
Volute-type pump head affords optimum conversion of velocity to pressure energy. Head can be rotated 360°.

ONE-PIECE IMPELLER AND SHAFT

Backward curved impeller and integral shaft assembly assures top operating efficiency and non-clogging flow characteristics. Integral stainless steel construction eliminates keys, pins and lock nuts within the casing.

SERVES ALL PUMPING NEEDS

Three models (4, 6 and 8 inch impeller sizes) in motor sizes to 25 HP—3600 RPM provide head and capacity range to meet all pumping needs.



ONE-PIECE INTERNAL SEAL

One-piece corrosion and heat resistant construction extends wear life, assures trouble-free processing and cleaning service. Unique cleaning arrangement (see opposite) allows for thorough sanitizing of seal.

CIP CHAMBER

Contains the drain-off of cleaning solution and sanitizers.

NO TAKE-DOWN FOR CIP

Unique auto-manual actuator controls cleaning and sanitizing of seals without take-down of pump. May be manually or automatically controlled.

New TRI-CLOVER CIP CENTRIFUGAL PUMP

Cleaned and Sanitized—Automatically—while running

Here's a new sanitary centrifugal pump that combines top operational efficiency with a simple, self-cleaning concept.

The new Tri-Clover "CIP" incorporates features which make cleaning in place as easy and effortless as turning on a light-switch. A *one-piece* impeller and shaft; a fully developed volute-type head, and a *one-piece* internal seal are among the many important modifications which will make the new Tri-Clover "CIP" the *first choice* for efficient, economical and versatile sanitary pumping.

As with all Tri-Clover pumps, the new "CIP" Series Centrifugal incorporates only the highest quality materials and is manufactured to meet the most exacting requirements present in the industry. Traditional Tri-Clover craftsmanship is your assurance of years of efficient pumping service at the lowest possible operating costs.

WRITE FOR BULLETIN CIP-260.

IN CANADA: Brantford, Ontario
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TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

P281

CIRCLE 10 ON INQUIRY CARD

Schedule of Events

August

20-23—Nat'l Assn. for the Specialty Food Trade Inc., Nat'l Fancy Food & Confection Show, Hotel Astor, NYC.
20-24—Nat'l Independent Meat Packers Assn., meeting, Rutgers Univ., New Brunswick, N. J.

September

11-13—Second Biennial Symposium on Foods, Oregon State Univ., Corvallis, Ore.
19-27—Internat'l Conference on Fish and Nutrition, Washington, D. C.
23-28—Master Brewers Assn. of America, meeting, Hotel Queen Elizabeth, Montreal, Canada.
25-28—Industrial Bldg. Exposition & Congress, New York Coliseum, NYC.
26-28—Sanitation Maintenance Show, Hotel Sheraton, Philadelphia.

October

1- 4—Produce Packaging Assn., meeting, Chase-Park Plaza Hotel, St. Louis, Mo.
7-12—Baking Industry Exposition, Convention Hall, Atlantic City, N. J.
9-10—Nat'l Pickle Packers Assn., meeting, Drake Hotel, Chicago.
18-20—Packaging Institute, Annual Nat'l Forum, Biltmore Hotel, NYC.
22-27—Milk Industry Foundation & Internat'l Assn. of Ice Cream Mfrs., meeting, Washington, D. C.
31-N1—Nat'l Automatic Merchandising Assn., Internat'l Symposium, McCormick Place & Conrad Hilton Hotel, Chicago.
31-N2—Packaging Assn. of Canada, meeting, Automotive Bldg., Exhibition Park, Toronto, Canada.

HORS D'OEUVRES

▸ Whether candy contributes to motoring alertness is being researched. Aim is to fill glove compartments with confections. What could be nicer than to save your sweet life with bon bons?

▸ The United States is furnishing 8,200 tons of surplus wheat to Iran. It will go to pay workers and to buy tools and materials for an agricultural development program. That's getting mileage out of a white elephant.

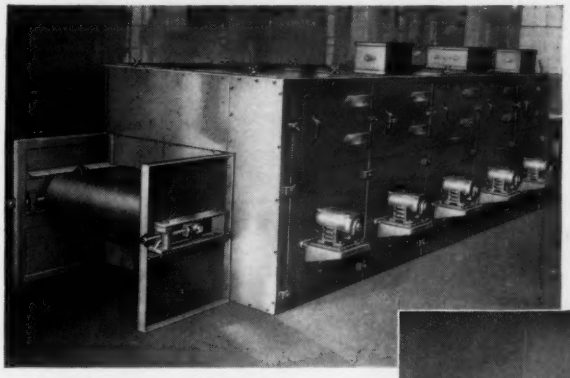
▸ Good health depends not only upon a long list of nutrients but the harmonious relationship between the lot of them. Nutritionists are trying to figure it all out. Meanwhile, don't let food faddists sell you any shortcuts to ill health.

▸ Industry enthusiasts forecast consumption of 13 billion hot dogs this year. Put 'em into one string, and Cape Canaveral could wrap it around the earth nearly 50 times.

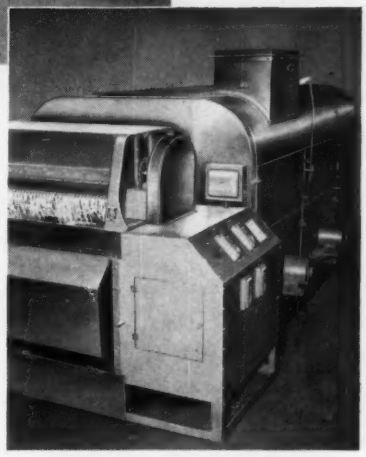
▸ The most sound product growth, observes Campbell's President Murphy, comes when the product out-performs the advertising. You can't fool about food because man is his own food quality meter.

▸ In this 20th year of bread enrichment, nutritionists have been extolling the high food value of the modern white loaf. By comparison, grandmother's bread is rich only in nostalgia.

FLEXIBLE FOR LABS — RUGGED FOR PRODUCTION



Sargent single pass pilot plant dryer for lab or production. Each section zoned and controlled independently for widest variation of temperature, humidity.



Single pass dryer with extruder — two drying sections, one cooling section. For pilot plant or production.

DRYERS by SARGENT

For Many Food Products

SARGENT'S small to medium size dryers are outstanding examples of the sound economy of "designing and building the machine for the job" in the food industry. These flexible, rugged machines may consist of but two or three drying sections and a feeder (vibrating or standard) — or where required, multiple drying sections plus baking, curing and cooling sections — all in one compact, space-saving, economical machine.

Engineered specifically for pilot plant or moderate volume production, they are easily enlarged by simply adding more drying sections and, where desired, extruders, granulators — even a blow-up section to "fluff" products such as dry breakfast foods during drying.

Because they are designed and built by SARGENT, these rugged moderate-size workers can be depended upon to do a he-man size job on food products and by-products — from milk curd to sliced apples, from cereals to fruits and nuts and coffee.

As with all SARGENT equipment, these new-size dryers are the speediest to erect, the easiest and most economical to clean-out and to maintain of any on the market. Performance is unconditionally guaranteed by us.

Write us your product-drying requirements and let us give you details.

C. G. SARGENT'S SONS CORPORATION

Graniteville, SINCE 1852 Massachusetts

PHILADELPHIA • CINCINNATI • CHARLOTTE • ATLANTA • HOUSTON • DETROIT
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CIRCLE 11 ON INQUIRY CARD

It's a juicy job for Koroseal

ENGINEERS at this frozen food plant needed pipe that could keep fruit juices flowing continuously—and virtually automatically—through various processing stages. Metal pipe was out of the question. Citric acid would corrode it.

The answer? Pipes and fittings made of Koroseal rigid PVC by B.F.Goodrich. Nothing can corrode Koroseal. It's unaffected by acids, alkalies, salt, alcohol and just about everything else that ruins other pipe. Koroseal doesn't react chemically. It's odorless, nontoxic, so there's no danger of product contamination.

Since Koroseal pipe weighs only ¼ as much as steel, it's easier and faster to install. It threads easily, can be cut, welded or drilled. It'll never rust, never need painting.

After three seasons' service, the owner of the packing plant had this to say: "Koroseal has met every one of our requirements. Not only was the installation economical, but we achieved the durability and sanitation that was so necessary. Our juice handling operation runs 24 hours a day, and we haven't had to shut it down once because of a pipe or fitting failure".

More and more companies are finding B.F.Goodrich Koroseal PVC pipe ideal for use wherever corrosion resistance, economical installation, minimum maintenance and long life are deciding factors. If you'd like to know more about Koroseal's advantages, call your nearby BFG distributor or write to us for a free booklet. *B.F.Goodrich Industrial Products Co., Dept. M-166, Akron 18, O.*

Koroseal—T.M. Reg. U.S. Pat. Off.

Koroseal rigid PVC products by B.F.Goodrich

DEVELOPMENTS TO WATCH

Strontium 90 is removed from milk by ion exchange in USDA lab. Process includes treatment with dilute citric acid and potassium hydroxide neutralizer, plus removal of excess water.

Up to 320 nitrogen analyses per 8-hr. shift can be made in single lab operation with Technicon's new automatic Kjeldahl device. Adaptable to process monitoring, it is accurate to $\pm 1\%$.

Canned concentrated milk will be produced by Nodaway Valley Foods formed by dairy researcher A. P. Stewart at Corning, Iowa.

Bread dough is extruded, cut, and quick frozen for retail by Homemade Bread, Sacramento, Calif. Top and bottom of package are baking containers for two pieces of dough.

Florida reports: (1) Freeze-dried orange juice made by Vickers-Armstrong. (2) Sweetened, canned grapefruit juice to which consumer adds water. (3) Citrus peel oil in new automobile paint. (4) Enzymatically debittered grapefruit products.

Substitution of dextrose for some of sucrose in evaporated milk used in chocolate adds flavor, color, and pleasing "mouth feel."

Frozen "instant" baby food has been developed by Gerber but not marketed. Company feels that it would require excessive promotion.

Turkey steak is made by pressure molding boned breast section.

Canned whole grain wheat with delicate flavor and high nutritive value has been developed by USDA. It is handy as substitute for rice and potatoes and ingredient in other dishes.

Rich golden color is imparted to broilers and egg yolks by adding recently isolated strain of algae, A-Zanth, to feed.

Chrome-plate for cans has been developed in Japan by Fuji Iron and Steel Co. Cost is said to be below that of tinplate.

See Who's Building What p. 14

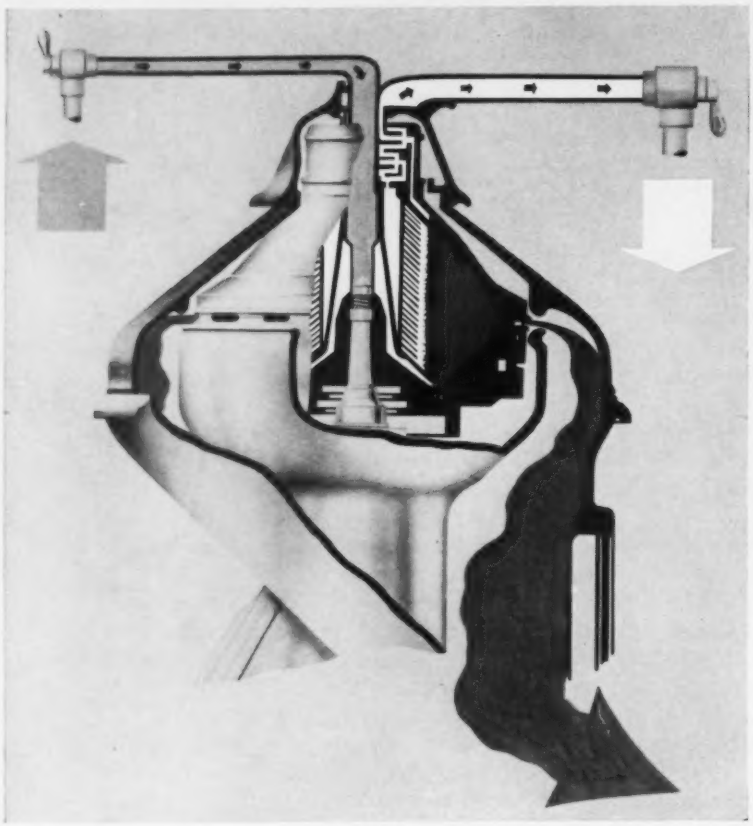
Citrus can prices have dropped. Canmaker cut 55-lb. tinplate to $18.63 per 1,000, then aluminum cans were offered at same price.

Washington Report p. 17

Container pool is General American Transportation innovation.

Food additives reference will be compiled by Food Protection Committee and National Institutes of Health. It will be comparable to U. S. Pharmacopeia and National Formulary.

FLUIDICS* AT WORK



Why sludge won't clog this self-cleaning centrifuge

There are no nozzles in the Pfaudler® Titan Centrifuge. Instead, you have *slots*.

Slots that can handle dry, compact sludge with particle sizes up to ⅛ inch in diameter. Slots that won't clog. Slots that keep downtime to a minimum.

SELF-CLEANING. Moreover, with this centrifuge, your labor costs are reduced because the Titan cleans itself while operating at full speed. Adjusting hydraulic controls accommodates varying solids content of the feed and desired sludge dryness.

HIGH CAPACITY. The Titan offers a separating power as high as 7500 times gravity, much more than you can get with other continuous centrifuges.

Throughput capacity ranges up to 6000 gallons per hour.

TACKLES TOUGH ONES. The Pfaudler Titan Superjector can handle even your most difficult separations:

- two liquids and a solid simultaneously
- solids that are only slightly heavier than liquids
- liquids that are highly viscous or aerated
- fine, slimy or abrasive particles

FREE BULLETIN. Our Bulletin 1002 spells out in detail all of the design features, gives specs for the seven different models, and outlines applications for the Titan Superjector.

TEST PROGRAM. Your products can be tested either in the Pfaudler Test Center or in your plant with a portable production unit.

Address requests for the booklet or questions about testing to our Pfaudler Division, Dept. FE-81, Rochester 3, New York.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS...the science of fluid processes

Who's Building What

Monthly Reports: These food firms will spend $27,377,820 for expansion.

Contracts Awarded

Anheuser-Busch Inc., St. Louis, Mo., warehouse addn., $750,000.

Blanton Smith Hatcheries, Nashville, Tenn., poultry hatchery, $154,420.

Dairymen's Assn., Honolulu, Hawaii, dairy plant, $881,000.

Doane Canning Co., Big Stone Gap, Va., cannery, $120,000.

Doyle Packing Co., Turner, Kan., warehouse & office, $431,633.

Frosty Morn Packing Co., Montgomery, Ala., meat packing plant, $1,036,767.

Great Atlantic & Pacific Tea Co., Flushing, N. Y., bakery, $10,000,000.

Pearce-Young-Angle Co., Greenville, S. C., food distribution plant, $300,000.

Utah-Idaho Sugar Co., Moses Lake, Wash., sugar storage silos, $400,000.

Proposed Projects

Anthony Pure Milk Co., Nashville, Tenn., plant addn., $115,000.

Burke Farmers Dairies, Inc., Morgantown, N. C., dairy processing plant, $220,000.

Edward Hebbeler, New Haven, Mo., soda drink bottling plant & warehouse, $200,000.

Fadler Produce Co., Tulsa, Okla., cold storage produce warehouse, $450,000.

Merit Frozen Foods Corp., Wallingford, Conn., frozen food plant, $250,000.

Narragansett Brewing Co., Cranston, R. I., brewhouse addn., $900,000.

Rhode Island Wholesale Food Distribution Center Assoc., Pawtucket, R. I., market terminals, $10,000,000.

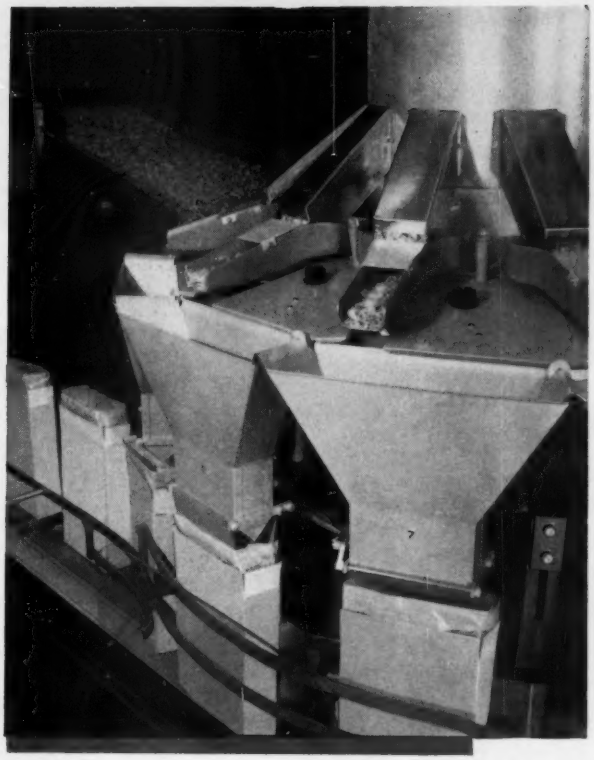
Scrivner-Stevens Grocery Co., Oklahoma City, Okla., grocery warehouse, $500,000.

Southern Beverages, Inc., Miami, Fla., bottling plant addn., $200,000.

Thomas O'Connor & Co., Inc., Manchester, N. H., milk processing plant, $119,000.

United Foods, Inc., Temple, Tex., grain storage facilities, $350,000.

WRIGHT NT Weigher



Rotary net weigher surpasses all other machines for packaging in cartons the total output of a continuous production process.

Dry cereals, crackers, and similar products can now be packaged more accurately at higher speeds with the Wright NT Weigher.

This system consists of (1) straight line carton conveyor, (2) controlled bulk feeder, and (3) rotating turret with 12 electronic weighing heads, each having a finish-fill feeder and bucket. *One attendant can monitor several systems.*

Weighing heads are transistorized for compactness, reliability, and indefinite life. Each weighing head contains its own complete detector, finish-fill feed relay, and rectifier, with all components being of plug-in construction for quick servicing.

Wright Machinery Company engineers are available to custom this system to your particular requirements. Update your packaging line now.

Packaging Machinery Since 1893

FE

WRIGHT MACHINERY COMPANY

MAIL THIS COUPON FOR COMPLETE INFORMATION

DIVISION OF SPERRY RAND CORPORATION ***DURHAM, NORTH CAROLINA***

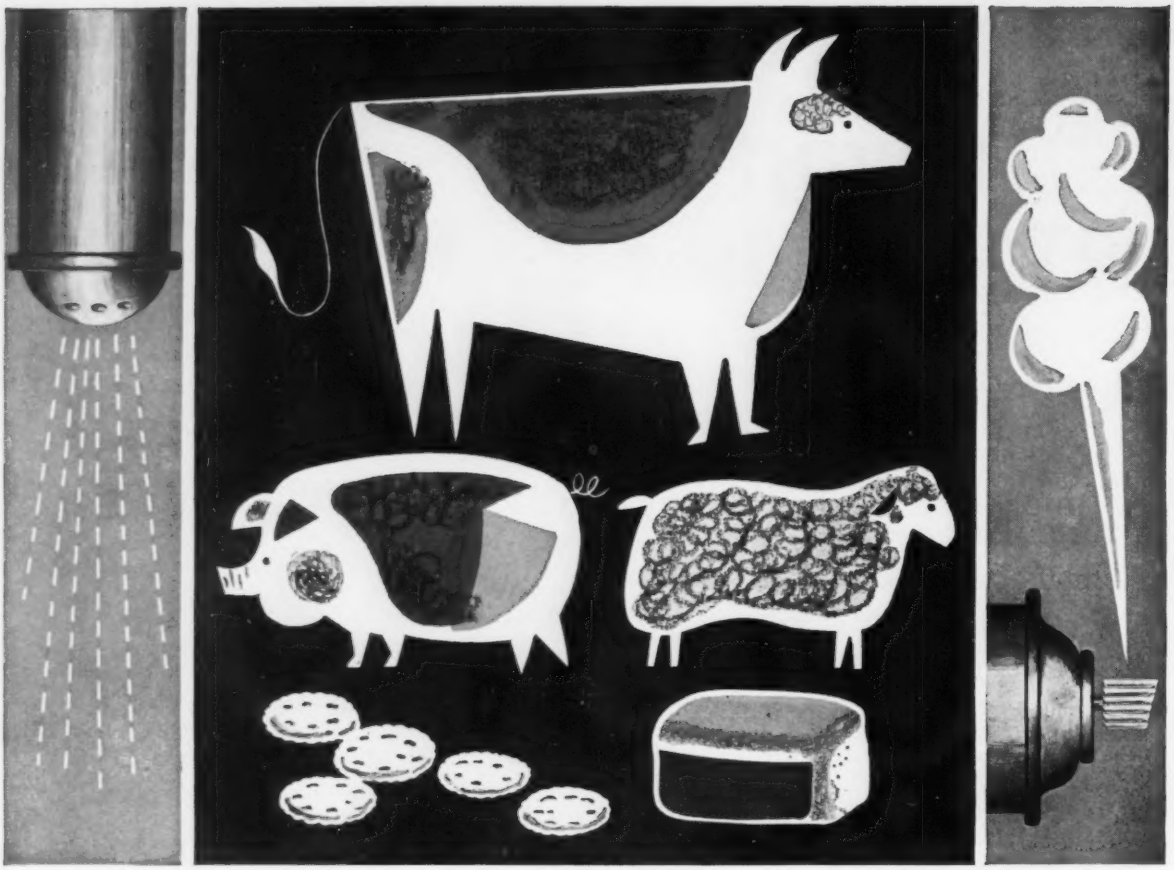
Gentlemen: Please send me technical details on your new Wright NT Weigher.

NAME.....

COMPANY.....

ADDRESS.....

PRODUCTS.....



RHOZYME® ENZYMES OFFER FLEXIBLE ADAPTABILITY AS MEAT TENDERIZERS AND FOOD MODIFIERS

Since RHOZYME proteolytic enzymes are microbiological products, they can be made to a variety of specifications and allow adaptability not afforded by enzymes from plant and animal sources.

For example, RHOZYME P-11 is tailored for optimum effectiveness in meat tenderizing formulations. Rohm & Haas offers basic formulas for both liquid and powder tenderizers. The liquids are ideal for packaging in aerosol spray dispensers. Rohm & Haas has done considerable research to provide good shelf stability to aerosol packaged tenderizers and makes the information available to you. RHOZYME P-11 has been approved by the Meat Inspection Division of USDA for use as a tenderizer in treating meat cuts.

Other RHOZYME proteolytic enzymes are designed for applications such as modifying whey protein for cheese spreads; acting as substitutes for rennet in making cottage cheese; improving quality of bread, crackers, cookies; making protein hydrolyzates for diet foods, cereals, pharmaceuticals.

Write to Dept. SP-16 for enzyme samples, information on aerosol tenderizers, and suggestions for additional uses of proteolytic enzymes in food processing.

ROHM & HAAS

PHILADELPHIA 5, PA.

RHOZYME

Washington Report

Carton standards near? . . .

"Puffed-up" profits . . .

Anti-trust hits wallets

Package Standards Coming?

Food makers will have to wait two months (maybe longer) to rebut widespread charges of package fakery made before Sen. Hart's subcommittee. Hearings aren't expected to resume until Congress adjourns.

What is Hart driving at? One suggested answer: Federal size and weight standards for food containers similar to those Internal Revenue Service sets for beer, wine, and liquor.

The solon, benefiting from a very favorable press, feels he is already producing results. He says that cereal manufacturers and produce packers have set up committees to check into packaging practices.

Sen. Hart says hearings showed "Situation is worse than I thought." That means: "Consumer lobbies really stirred up housewives, so we'll keep the probe going."

FDA: One Step Back . . .

FDA isn't fazed by its latest reverse in the Delson thin mints case. Gov't. lawyers feels the set-back is temporary, will fight the case all the way to the U. S. Supreme Court. Reason: They feel final outcome will set the mark for what constitutes "deceptive packaging" for years to come.

In the latest action, a district court reviewed Delson's problems with breakage and Paramount Carton's solution: A box with hollow ends, hollow dividers, and double walls. Said the court: "Efficacy of the package outweighs its alleged deceptive quality."

. . . Four Steps Forward

Moving ahead on firmer ground, FDA sleuths seized shipments of four well-known manufacturers on grounds of short weighting. Quaker Oats, also up on FTC charges of alleged price discrimination, was accused of marketing puffed wheat cartons that were 15% below stated weights, puffed rice boxes that were 6% on the underside.

Deputy Comm. Harvey bluntly said QO was aware of the short weights back in April, that "it continued distribution of the short weight packages until action was taken by FDA." He traced the defection to a new manufacturing process which puffs the grains of wheat and rice to a greater volume than before. As a result, he added, this results in a package containing less of the food product without a change in weight.

FDA estimates that the short weighting meant "10% extra profit" for QO. Monthly volume of the items was placed at over $200,000.

In other actions, FDA accused:

1) Corn Products of shipping 95 cases of chocolate-flavored syrup in jars marked 12-oz. but weighing 1.17% less;

2) Prince Mfg. Co. of shipping 71 cases of macaroni in 1-lb. packages weighing 1.13% less;

3) F & L Food Products of shipping 15 cases of shoestring potatoes in 1.15-oz. cans weighing 1.71% less.

Cost of Price Fixing

Justice Dept's "pocketbook" drive against price fixing (see FE July p. 33-35) was spelled out further last month. Having wrung "no contest" pleas and $45,000 in fines from 5 bakery firms indicted for rigging prices, department sued the accused for double damages and forfeitures. The five: Ward Baking, American Bakeries, Derst Baking, Flowers Baking, Southern Bakeries.

Atty. Gen. Kennedy declined to estimate the total amount of damages involved. Under the False Claims Act, government can sue for $2,000 forfeiture for each violation, plus doubled damages.

In St. Paul, Justice threw criminal and civil anti-trust suits against the four biggest salt companies: Morton, International, Diamond Crystal and Carey on price-fixing charges in sale of rock salt.

Morton and Diamond Crystal denied the charges. Carey and International declined to comment.

FTC: Fast Track

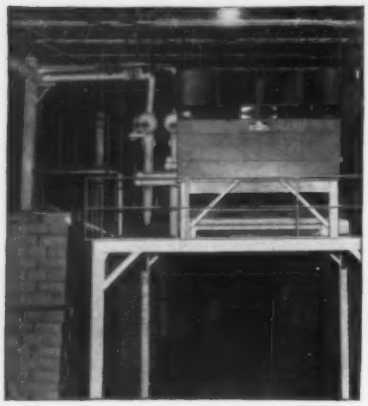
Chairman Paul Rand Dixon's aim to upgrade FTC from "a hearse to a squad car" shifted into high gear last month. Effective July 21, the commission carried out several trial changes covering complaint actions.

Probably the most significant change is the one covering consent decrees. Under the new rules, you will have 10 days to tell FTC whether you'll negotiate a consent order to a proposed complaint, and 30 days to reach agreement. Otherwise, **once the complaint order is issued, there'll be no opportunity for consent settlements.**

Bottlers Seek FDA Slowdown

Soft drink firms are asking FDA to put off its requirements that pop bottles list ingredients after next June 15. Some bottlers sounded FDA out on putting the information on bottle caps. FDA's reply: Can such data be easily read there? (Turn page)

"NIAGARA" NO-FROST



. . . DEPENDABLE and DURABLE

Experienced operating men will tell you that Niagara No-Frost refrigeration gives you the best results in food freezing, cold storage warehousing, fruit and vegetable chilling.

Especially in the tough spots, in such conditions as meat packing and crop pre-cooling, where there are large amounts of moisture and extra air-borne causes of corrosion, No-Frost equipment out-lasts, outperforms and out-saves all other types.

Because it PREVENTS all frost or ice formation from the start, Niagara No-Frost gives you always full capacity, prevents waste of power. You escape all trouble and labor of de-frosting, have rooms that are always clean and sanitary, enjoy the lowest operating costs per ton of refrigeration.

For more than a quarter of a century Niagara No-Frost durable, dependable equipment has been making money for its users.

Write for Bulletin 105.

NIAGARA BLOWER COMPANY

405 Lexington Ave., New York 17, N. Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

Washington Report *(Continued)*

Revised USDA Grade Standards:

Canned Plums. Lowers the degree Brix ranges, provides for varying amounts of plum juice as packing media.

Rough Rice, Brown Rice, Milled Rice. Allows not more than 10% of noncontrasting rice, sets special grades for parboiled rice.

Canned Green Beans, Canned Wax Beans. Lowers allowable drained weights in some instances to facilitate packing.

Canned Apricots, Canned Clingstone Peaches. Revises drained weights (lower for apricots, higher for peaches), describes fill weight procedure of statistical measurement.

FDA Standards of Identity:

Canned Asparagus. Stannous chloride (not exceeding 15 ppm) allowed as optional ingredient in glass-packs. Proposed by P. J. Ritter Co.

Canned Lima Beans. Allows trace of calcium salt as optional ingredient. Proposed by California Packing Co.

Self-Rising Flour. Allows sodium aluminum phosphate as acid-reacting optional ingredient. Proposed by Victor Chemical Works.

Wheat Flour. Allows acetone peroxides as optional ingredient for bleaching and artificial aging. Proposed by J. R. Short Milling Co.

Bread. Central Soya Co. proposed that hydroxylated lecithin be added to the list of emulsifying substances used in shortenings. FDA also proposes that parenthetical exception reading "except lauric acid" be deleted on grounds there is no scientific basis for its exclusion.

Poultry inspection regulations were revised by USDA to minimize allowable water absorption. For frozen products, limits are: Turkeys 20 lb. and over, 4½%; turkeys 10-20 lbs., 6%; turkeys under 10 lb., 8%; chickens 5 lb. or less, 8%; all others, 6%.

Anheuser-Busch announced approval of Federal District Court, Miami, to sell its brewery in that city to National Brewing Co., Baltimore. Transfer date: Oct. 2.

FE's Box Score on Key Legislation

BILL	SPONSOR	OBJECTIVE	COMMITTEE
HR 6489	Sikes	Establish fund for advancement of commercial fisheries.	Marine & Fisheries
HR 7457	Goodling	Adjust competitive conditions between domestic and foreign industries as to wages and working conditions.	Ways & Means
HR 7827	Breeding	Amend '48 Sugar Act to provide bigger domestic quotas.	Agriculture
HR 7828	Dulski	Impose tariff duty on bread imports.	Ways & Means
HR 7830	Keogh	Make permanent existing tax suspensions on first domestic processing of coconut and palm oils, fatty acids.	Ways & Means
HR 7838	Stced	Provide added research facilities at State agricultural experiment stations.	Agriculture
HR 7871	Smith (Ia.)	Extend Meat Inspection Act coverage to plants subject to NLRB jurisdiction.	Agriculture
HR 7595	Miller	Establish advisory committee on King, Silver salmon.	Marine & Fisheries
HR 8215	Hansen		
HR 8034	Kilgore	Set 35% import duty on unprocessed shrimp.	Ways & Means
HR 8136	Celler	Increase maximum fine for violation of Sec. 1, 2, or 3 of Sherman Act from $50,000 to $100,000; require that individual convicted of second violation be both fined and jailed.	Antitrust
HR 8137	Celler	Increases corporate fine in price fixing or market allocation violations to $500,000, individual fine to $100,000.	Antitrust
HR 8138	Celler	Amends Sec. 14 of Clayton Act to require corporate officials to report antitrust violations to officials with power to stop same or face penalties called for in HR 8136 (above).	Antitrust
HR 8139	Celler	Require certificates of non-collusion from bidders on government contracts where identical prices were quoted during preceding 2 yrs.	Antitrust
HR 8319	Teague	Prohibit subsidized export of agricultural commodities to Communist nations.	Agriculture
S 2252	Kefauver	Same as HR 8136 (above).	Antitrust
S 2253	Kefauver	Same as HR 8137 (above).	Antitrust
S 2254	Kefauver	Same as HR 8138 (above).	Antitrust
S 2255	Kefauver	Same as HR 8139 (above).	Antitrust

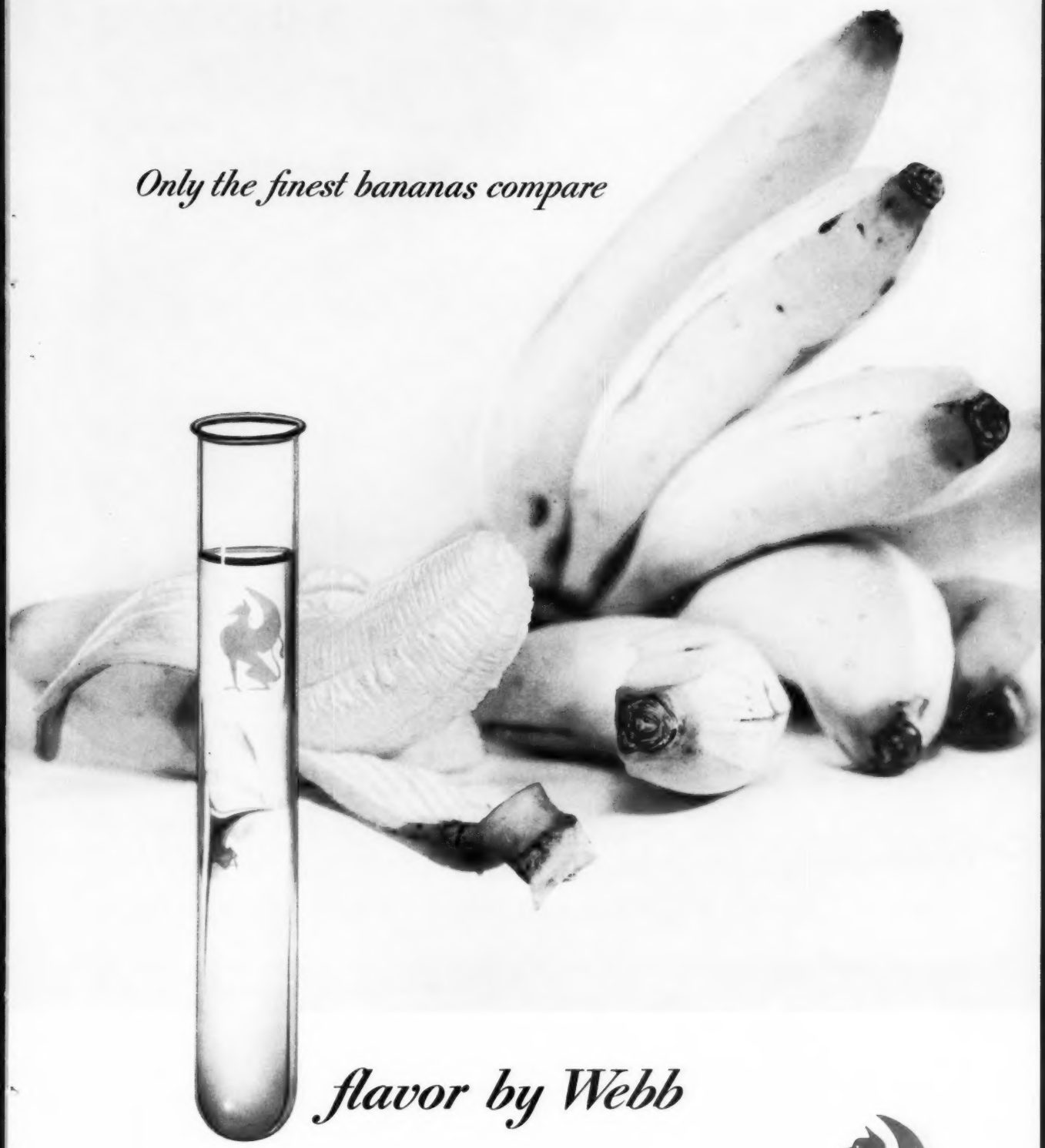
ACTION TAKEN

BILL	SPONSOR	OBJECTIVE	STATUS
HR 5463	Cooley	Extend Sugar Act to June 30, '62.	Passed both Houses, signed into law.
HR 2010	Gathings	Extend Mexican farm labor program to 12/31/63.	Passed House. Senate Agric. Comm. amendment gives Labor Secty. more power over hiring, curbs use of Mexicans on automatic machinery requires hiring of more U. S. workers.
S 606	Dodd & Bush	Establish shellfish research center in Milford, Conn.	Passed Senate, sent to House Fisheries Comm.
S 1462	Engle & Kuchel	Establish minimum quality standards for grapes, plums.	Passed Senate, sent to House Agric. Comm.

CIRCLE 18 ON INQUIRY CARD

CIRCLE 19 ON INQUIRY CARD →

Only the finest bananas compare

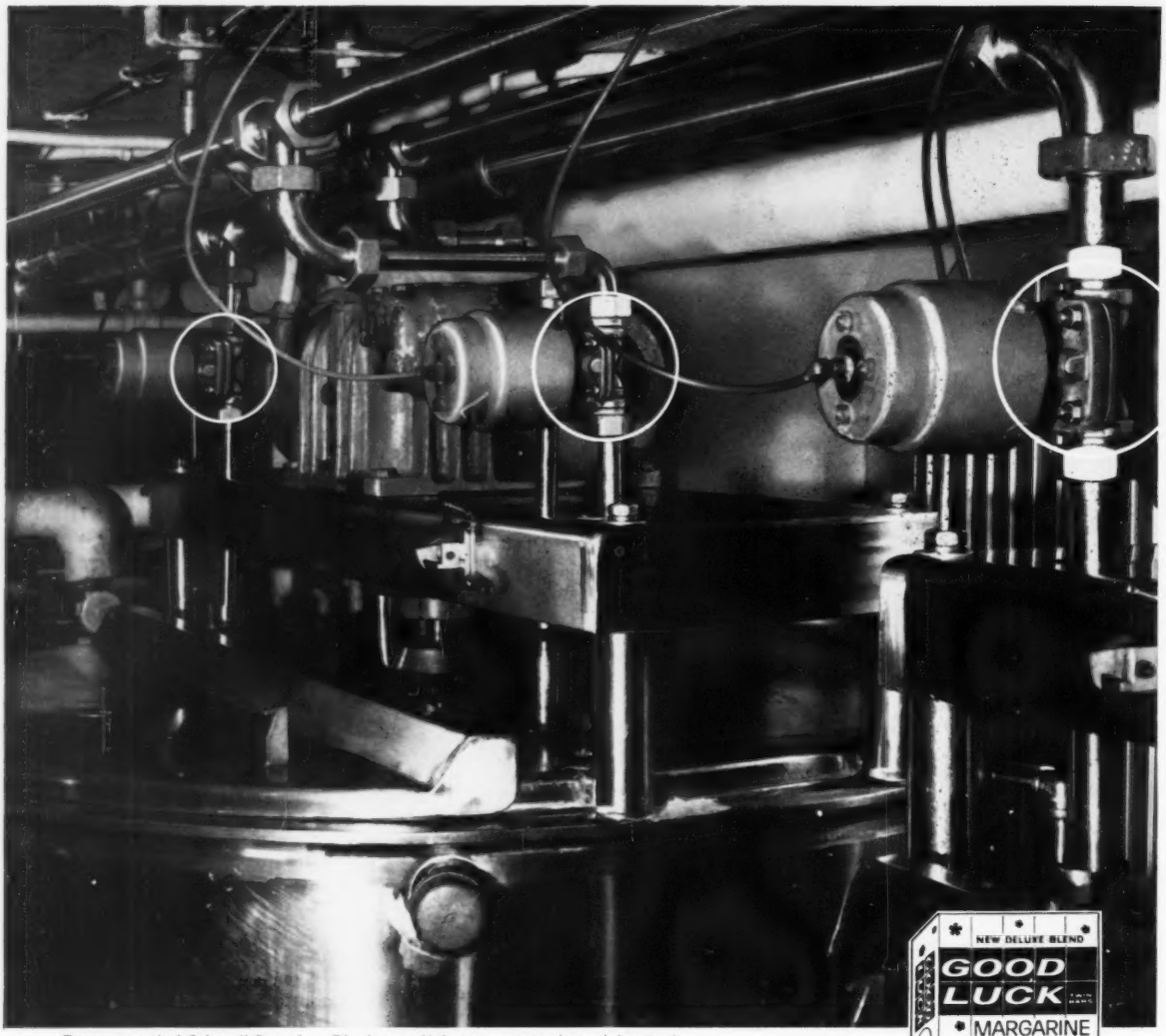


flavor by Webb

Banana is one of the delicious, synthetic specialty flavors created by Webb. Whether you need the spray-dried form, or a specific liquid grade, Webb has the answer for your application. And no matter which form you use—in any of the many Webb specialty and standard flavors—you get consistently fine flavor. For samples or information, call or write Webb. Food flavor specialists for over 50 years.

R. D. WEBB & CO., INC.

STIMPSON AVENUE AND STILES STREET, LINDEN, NEW JERSEY



Power-operated Grinnell-Saunders Diaphragm Valves on margarine mixing tanks

Grinnell-Saunders Diaphragm Valves control "Good Luck" Margarine mix round-the-clock

Valves give trouble-free service on vegetable oil, milk, brine, ice water... even after 4 years!

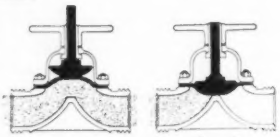
4 years ago, Lever Brothers installed stainless steel Grinnell-Saunders Diaphragm Valves in their Toronto, Ontario processing plant. The valves' job: controlling the flow of vegetable oil, milk, brine, ice water — all used in making "Good Luck" Margarine.

Today, every one of these valves is still on the job. Yet the system is in operation 24 hours a day!

Grinnell-Saunders Diaphragm Valves operate easily . . . shut off *completely* . . . even after years of tough service. There's big savings on maintenance, too!

What's more, materials flow smoothly through these stick-free valves. Bonnet mechanism is completely isolated from material in the line to prevent corrosion and contamination. And you get a wide selection of body, lining and diaphragm materials.

Learn how dependable Grinnell-Saunders Diaphragm Valves can help your operation. Write Grinnell Company, Providence 1, Rhode Island.

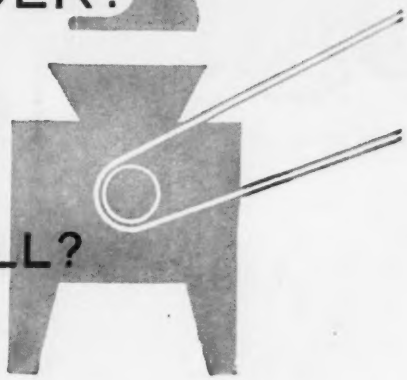


GRINNELL COMPANY, PROVIDENCE 1, R. I. • BRANCH WAREHOUSES AND DISTRIBUTORS FROM COAST TO COAST
PIPE FITTINGS • VALVES • PIPE HANGERS • PREFABRICATED PIPING • UNIT HEATERS • PIPING SPECIALTIES

WHAT DO YOU DO TO YOUR PRODUCT?

DO YOU
CRUSH IT
IN A
MEAT GRINDER?

DO YOU
SMASH IT
IN A
HAMMER MILL?



some people don't, you know,

some people cut their product into little dices.

PICKLES for the meat industry are now cut into ¼" or ⅜" cubes.

PICKLE RELISH of high quality is now cut into ⅛"cubes or pieces of ⅛" x ⅛" x ¼".

CHEESE is now being cut into little and big dices. Roquefort cheese is easily diced at a temperature of 10°F.

MEAT with little fibre content such as bologna is cut into small dices for sandwich spreads and other products.

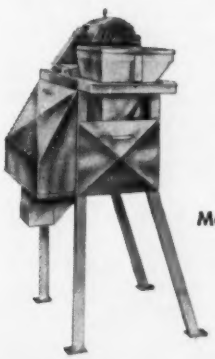
CHERRIES for ice cream dip or other purposes, are cut into little dices.

ALL KINDS OF FRUIT are cut into various small dice sizes for use in numerous products.

NUMEROUS PRODUCTS are now also being cut into julienne strips or thin slices with the "RA".

All of this is accomplished with the Urschel Model "RA" at capacities of up to 10,000 pounds per hour.

We'll be glad to test *your* product in our modern product cutting research kitchen. Write us today.



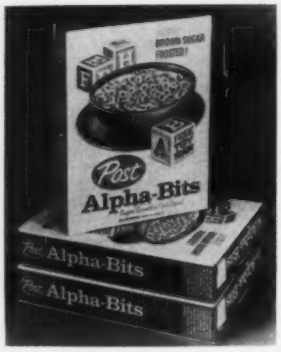
Model "RA" Dicer

URSCHEL
LABORATORIES INC.
VALPARAISO, INDIANA

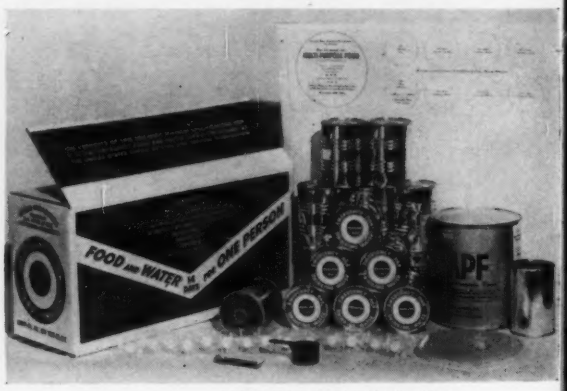
Designers and manufacturers of precision, high speed cutting equipment for food products.

new packages & products

BISCUITS IN SHRINKABLE FILM



REDESIGNED POST LINE



SURVIVAL KIT WITH MPF

RECLOSABLE BACON PACKAGE

SHRINKABLE FILM FOR MULTI-PACK BISCUITS

First use of a shrinkable film for multi-packing and the first multi-pack application of any kind for refrigerated biscuits is announced by Gladiola Biscuit Co., Dallas.

New concept—multiple packing of six biscuit canisters in a heat-shrunk film overwrap—is expected to attract store operators and consumers through simplified handling and price-marking.

Overwrap used is "Reynolon," an oriented polyvinyl chloride film from the plastics division of Reynolds Metals Co. **(311)**

POST RESTYLES PACKAGING FOR STANDOUT APPEARANCE

Entire line of cereals from Post Div. of General Foods will soon appear on store shelves in completely restyled packages. Net effect, say Post spokesmen, "is to make the line stand out through a quieter, more legible, and refined appearance to contrast with today's 'busy, shouting' designs."

Features are refined type face, simplified side and end panels for easy product identification, and colors keyed to each of the 12 Post items. First to reach the shelf will be Alpha-Bits, carrying illustrations of product in-use and a plastic toy train premium.

RECLOSABLE BACON CARTON HAS MAXIMUM VISIBILITY

Unique bacon package combining maximum visibility with the convenience of a reclosable carton, has been developed by the Du Pont Co.

Although new "Show Pak" appears similar to other overwrapped bacon packs when sealed, a fold-over lid is tucked against the back. After cellophane is removed at home, cover folds out and over the bacon, locking for storage, but still providing easy access to product.

Unit is claimed to have up to 50% more visibility than window cartons at 10% less materials cost, according to Du Pont. **(313)**

SURVIVAL KIT FEATURES MULTI-PURPOSE FOOD

General Mills' Multi-Purpose Food (MPF) is the basic nutrient

FROZEN VIENNESE ROLLS

REDESIGNED PRETZEL PACKS

BRANDLESS JAM LABEL

PRUNES IN CELLOPHANE

of a new food and water survival kit capable of sustaining one person for 14 days in an emergency situation.

Fourteen pints of vacuum-packed water, Vitamin "C" ascorbic acid supplement, and the necessary utensils are also included in the 24-lb. 'Emergency-Pak' which has a shelf life of 3 to 5-yr.

Kit, priced at $8.98, is claimed to meet the survival specifications as prescribed by the Office of Civil & Defense Mobilization and is available from Surviv-All, Inc., 515 Madison Ave., N. Y. C.

MARKET TESTS BEGUN FOR FROZEN VIENNESE ROLLS

West Coast market testing for three new frozen, pre-sliced Viennese Rolls in orange nut, cinnamon nut, and apple nut varieties is being conducted by Food Products Div. of Pet Milk Co.

Products require no baking and can be served at room temperatures or warmed slightly. Attractive full panel pictorials of each product are displayed on Marapak cartons supplied by Marathon Div. of American Can Co. **(314)**

JAM LABEL SPARKLES WITHOUT BRAND NAME

A brandless label has been introduced by Squire Dingee Co. for Chicago firm's "New Pack" of "Ma Brown" strawberry Preserves.

Only the words "New Pack" (in white) and "Strawberry" (in black) appear on the die-cut label, which features a full color vignette of strawberries in a straw-colored print box. Brand name, company name, and size are printed only on the caps for all three sizes.

Label was created by Squire Dingee and produced by the Fraser Label Co., Chicago **(315)**

HYGRADE UPGRADES PRETZEL PARADE

Putting its best food forward in today's booming multi-million-dollar pretzel market, Hygrade Bakery, Philadelphia, is now offering its line of pretzels and potato chips in attractive new packages.

Line had previously been packed with overwraps whose old-fashioned, cluttered appearance hindered impulse sales. Redesigned printed cartons feature solid color backgrounds, close-up photos, and a perky chef cartoon figure. Design and printing is by Lord Baltimore Press. **(312)**

PUSH CONFECTIONERY PRUNES IN CELLOPHANE BAGS

Rotogravure - printed package variations with diversified vignettes are helping Mayfair Packaging Co. merchandise its line of Farmkist "Tenderiffic" Prunes as an actual confection.

Impulse buying impact of new packages helped influence San Jose firm's decision to process the product for direct-from-the-bag

For more information, circle key numbers on Reader Service Card, back of book

* MODEL 60L SEAMER—High Speed Straight Line Feed Closing Machine—or with disc feed for can making—is used by these canners for seaming cans 2⅛"—4¼" in diameter at speeds up to 500 cans per minute. Also available with disc type can feed for can manufacturing use only.

Canners and can makers the world over need...even demand the ultimate in simplified, rugged, efficient design. These demands are met by Angelus...the nation's only manufacturer exclusively producing automatic can closing machines.

Angelus seamers, backed by over 45 years of experience, are rugged and dependable; they are simple to operate and maintain; they represent the lowest possible initial investment.

WRITE TODAY for complete details. Specify products, can dimensions and your capacity requirements.

ANGELUS
Sanitary Can Machine Company
Cable Address "Angelmaco" Western Union Code
4900 Pacific Boulevard • Los Angeles 58, Calif.

eating in addition to established uses as a dried fruit.

Reverse printed and designed by Milprint, Inc., bags consist of cellophane with a polyethylene extrusion coating for freshness. **(316)**

READY MIX dill seasoning in liquid form is now being marketed nationally by W. G. Peacock Co., Chicago, in 5-oz. flint glass bottles from Hazel-Atlas Div. of Continental Can Co. **(317)**

New Product Shorts

Sour cream that's not really sour has been developed at Cornell University. Chief advantages cited are mildness, smoothness, long storage life, and its production in a variety of fruit flavors.

Happy Island Punch, a combination of six tropical fruit juices enriched with Vitamin C, is on the market from Realemon-Puritan, Chicago.

Coconut Fluffs, Lemon Puffs, Mocha Mallows, and **Zeebs** are latest additions to Burry Biscuit Corp.'s cookie line.

Packaging Briefs

High-purity triethylene glycol, useful as a plasticizer or humectant in cellulosic food packaging materials and in cork seals for bottled foodstuffs and beverages, is now available in commercial quantities. Supplier, The Dow Chemical Co., has received FDA clearance. **(318)**

PCP, a polyethylene film coated on both sides, is said to provide added product protection as well as greater transparency. Developed by Pkg. Div. of Olin Mathieson Chemical Corp. **(319)** film has a polymer coating and is expected to be used chiefly for wrapping nuts, hard and soft candy, and dried fruits.

Two FDA-approved polypropylene polymers, 4011 for extrusion and 4014 for injection molding, are announced by AviSun Corp. **(321)** Suggested uses are squeeze tube packages, injection molded containers for dairy packages, boilable food packs, and blow molded containers for baby food.

CIRCLE 24 ON INQUIRY CARD
CIRCLE 25 ON INQUIRY CARD ➔

Wey-rite,® Life Research's high protein diet, stays fresh and free-flowing in Riegel Pouchpak®

"Wey-rite," long established high protein food alternate is packaged in highly protective Riegel "Pouchpak". . . a pouch-paper/poly/foil combination engineered for high-speed automatic filling equipment. Three-color printing by Riegel.

Many of the country's sales leaders turn regularly to "Pouchpak" for assured protection of flavor and quality. It's a whole family of high-performance laminated materials, tailor-made by Riegel to meet the specific needs of each product and each packaging machine.

We've a flair for thinking of *every* product as something special . . . and developing for it the one best packaging answer . . . be it pouch paper, glassine, foil, film, or combination . . . printed, coated or plain. Write for more information today . . . for the new ideas come from Riegel.

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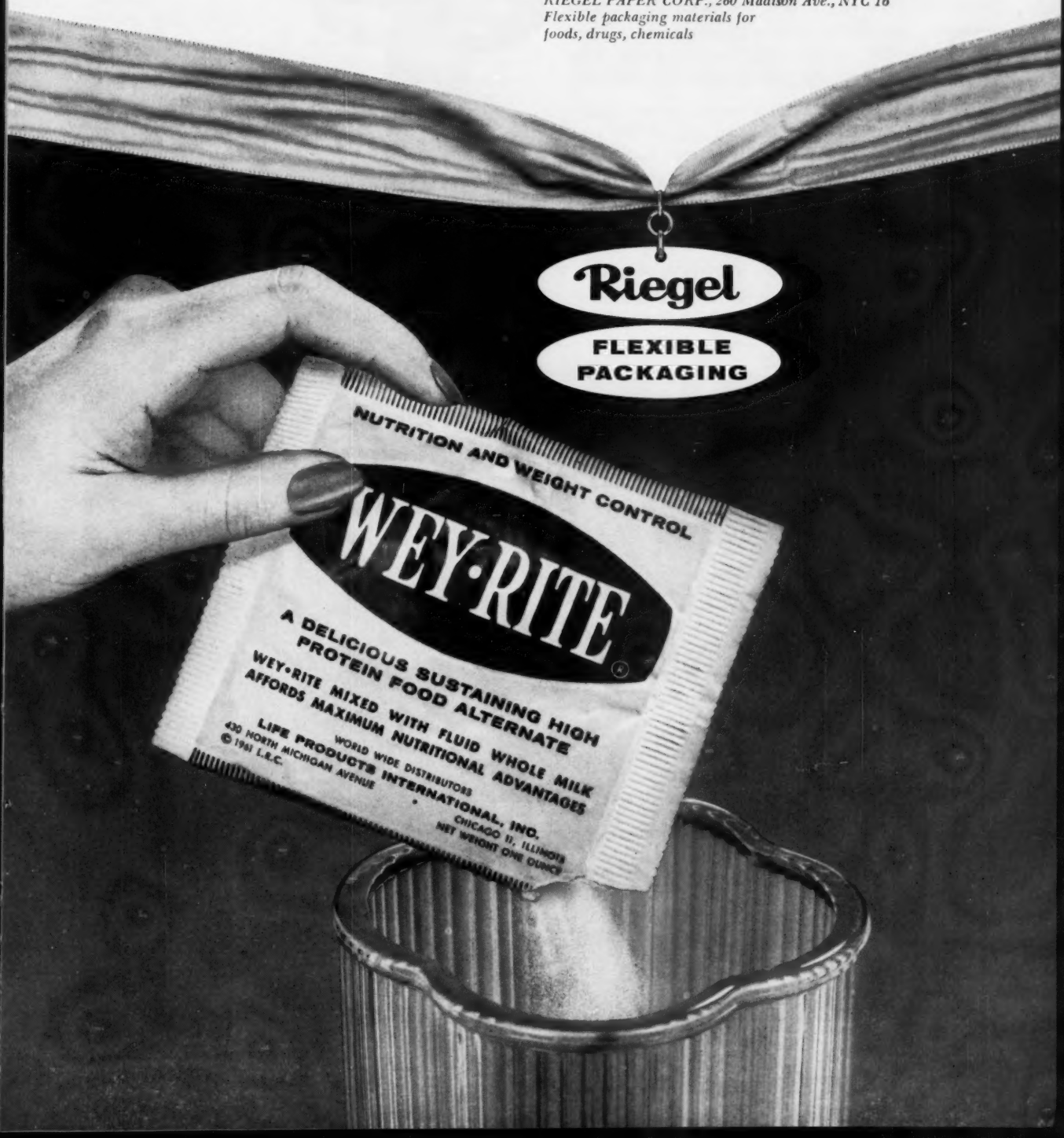
RIEGEL PAPER CORP., 260 Madison Ave., NYC 16
Flexible packaging materials for foods, drugs, chemicals



"Made OF Stainless Steel ...Made BY Jenkins"

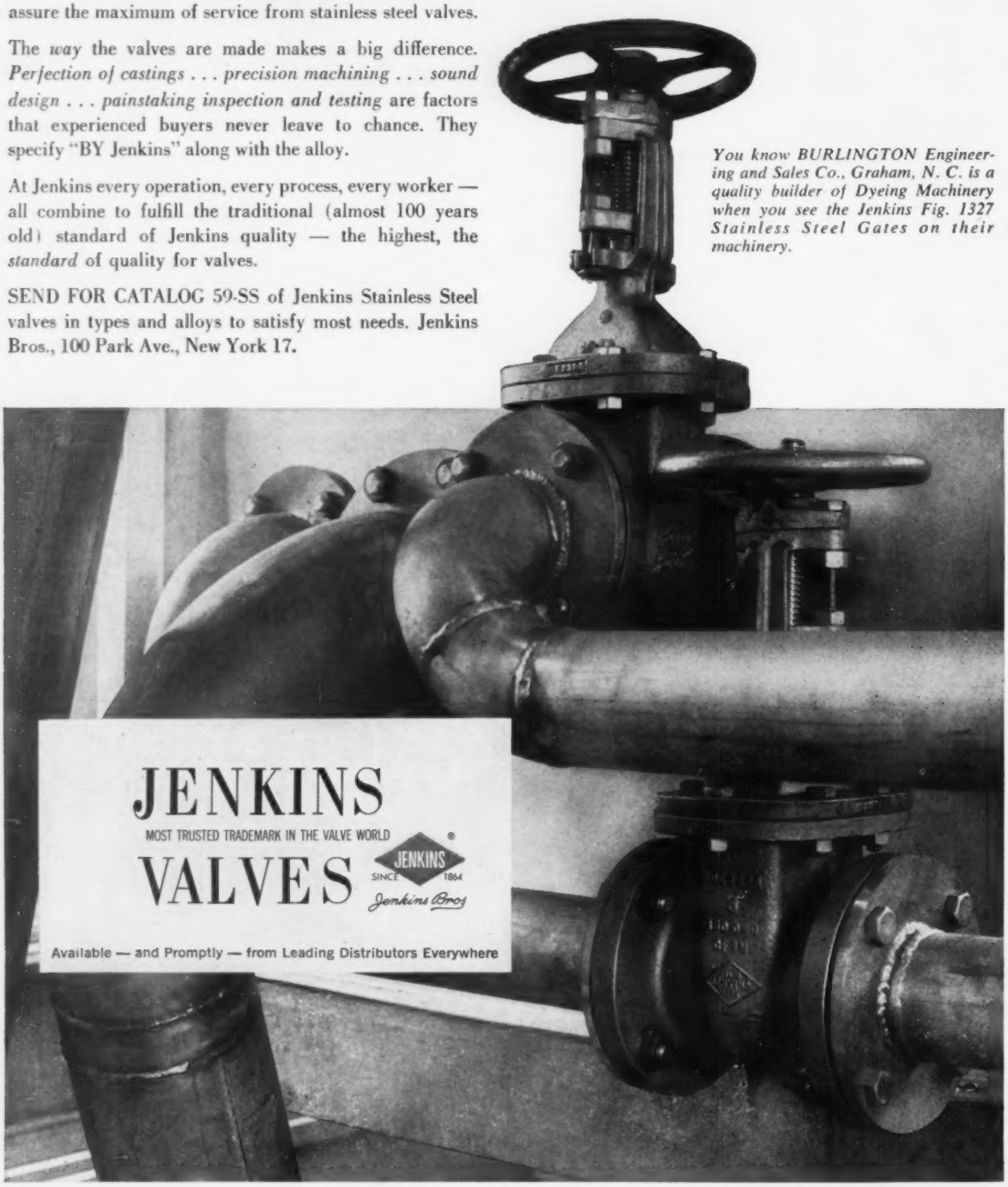
Write the COMPLETE SPEC for an extra-measure of service

Of course the metal, the alloy, is important when applications require stainless steel valves. But the specification for a suitable alloy is only half the specification needed to assure the maximum of service from stainless steel valves.

The *way* the valves are made makes a big difference. *Perfection of castings . . . precision machining . . . sound design . . . painstaking inspection and testing* are factors that experienced buyers never leave to chance. They specify "BY Jenkins" along with the alloy.

At Jenkins every operation, every process, every worker — all combine to fulfill the traditional (almost 100 years old) standard of Jenkins quality — the highest, the *standard* of quality for valves.

SEND FOR CATALOG 59-SS of Jenkins Stainless Steel valves in types and alloys to satisfy most needs. Jenkins Bros., 100 Park Ave., New York 17.



You know BURLINGTON Engineering and Sales Co., Graham, N. C. is a quality builder of Dyeing Machinery when you see the Jenkins Fig. 1327 Stainless Steel Gates on their machinery.

Packaging Pointers

Make-your-own tins trend quickens . . . Canco's answer? . . . Plastic's future

More Integration Coming Up

Two significant developments suggest that food makers will intensify efforts to make their own cans.

1) Hunt Foods, whose metal and glass container division accounts for 13% of overall sales, will plunk down $9 million in converting can-making facilities to lithographed tins. Firm now sells 85% of its glass containers, 20% of its cans, to outside customers. However, HF expects the switch to lithography to hike can sales.

2) Tillie Lewis Foods last fall tentatively started making its own cans, found the step profitable. Firm then built new can-making plant which is scheduled to meet bulk of company's future needs. Significantly, up to now, it's been assumed that only the bigger processors could afford to do their own fabrication. Move by Tillie Lewis (Sales: $22-million) indicates that smaller firms will take the plunge.

The moral of all this: Suppliers will be challenged more than ever before to shave prices and upgrade their services to food makers.

Can-Maker's Revenge

With processors making their own cans, wags have wondered when old line can-makers would go into food packing. Well, American Can has decided to do just that.

To spur marketing of canned soft drinks, Canco will set up six plants (each with a line capacity of 700/min.) for contract packing of beverages. Can-maker supplies gas, treated water, and labor, but customer furnishes his own packaging supplies and product ingredients. Pricing is FOB platform.

Move is aimed at getting around bottlers' reluctance to invest heavily in canning lines for only a small portion of overall volume. Also, Canco hopes that large volume runs at contract plants will make tins' retail price more competitive.

Better Garb for Sweets

Stronger protection and smoother handling are being assured candy makers by new developments in flexibles. So observed Milprint's P. A. Absalom at recent Pa. Mfg. Confectioners' Assn.'s meeting.

Among the trends cited by Absalom: (1) Glassine laminated with wax to porous tissue for easier sealing, improved moisture barrier. (2) Silicon-treated wax paper for faster release of tacky items. (3) Use of triethylene glycol-film plasticizer to retard cellophane's tendency to become brittle.

New Twists in Multi-Packs

Aluminum foil cartons and polyethylene bags are being tried by brewers to push multi-unit sales. Sicks' Rainier Brewing, Seattle, which tested the foils for 12-packs last year, is extending carrier-type (complete with handle) to 6-packs.

Repeat promotion of 2½-mil poly bags, by Jacob Ruppert, New York, pivots around idea of filling sacks with ice cubes to keep beer cold. In the past, bag idea "helped to move 16-oz. size, ordinarily a slow mover as a single unit, at a fantastic rate," reports Robert A. Massa, sales promotion mgr.

Unlimited Future for Plastics

Future growth of plastics as a food packaging medium will outdistance gains made to date. That's the prediction made by—naturally—Plastic Food Container Assn., Chicago.

Association lists these factors as persuading food makers: Improved rigidity and clarity of polystyrenes and polyethylenes; new forming techniques bringing about shapes and styles previously unobtainable; innovations in automatic filling and capping that will eliminate manual labor.

BRIEFS

Natural tie-in: To introduce its new all-meat frankfurter, Hartford Provision inserted special tube of new "Diablo" mustard in 1-lb. packs.

Analysis of test equipment used for measuring bulge and resistance to compression in folding cartons is available from Packaging Institute, New York 17, for $1.

Plastic gallon milk jug, debuted by Hydrocarbon Chemicals, is said by manufacturer to average 25 round trips vs. 11 for glass version.

How to upgrade your packaging machinery maintenance will theme conference workshops of forthcoming Packaging Machinery Mfrs. Institute Show in Detroit, Nov. 7-10. Among the speakers: G. Douglas Reed, vice pres., McCormick & Co.

Trend harbinger? Well-known package design outfit, Lippincott & Margulies, is adding "marketing consultants" to its services. Firm says 40% of assignments it receives now call for marketing research—double the level of 5 yrs. ago.

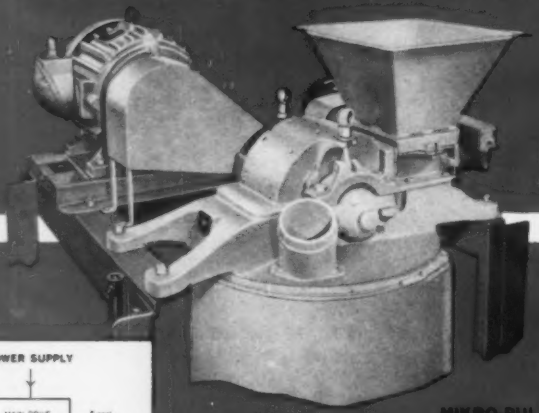
Economize!

AUTOMATED...GRINDING AT MINIMUM COST...

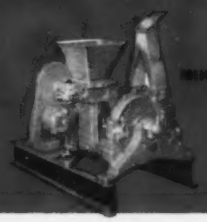
with the

NEW MIKRO-MONITOR

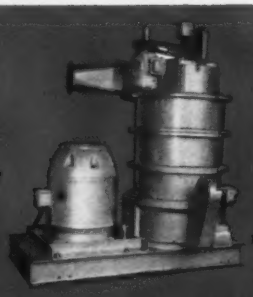
Automatic Load Control • Specifically Designed for



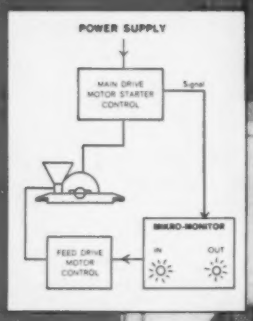
MIKRO-ATOMIZER

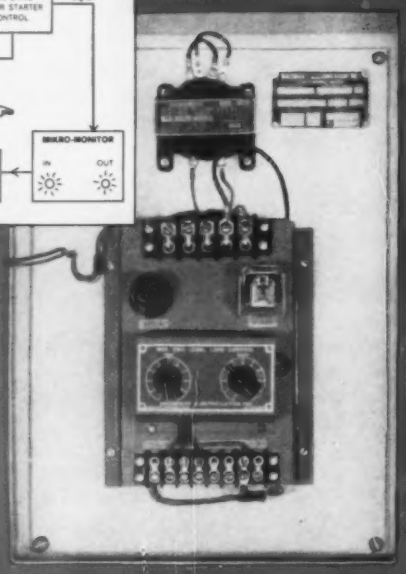


MIKRO-PULVERIZER



MIKRO-BUD





The MIKRO-MONITOR is housed in a compact 12" x 6" x 17" steel wall cabinet, with pilot lights on cover to indicate flow conditions.

- **Increased output up to 25 per cent.**
- **Constant operation.**
- **Virtually no supervision.**

Designed to prevent overloads automatically, by off-on control of the feed motor as a function of the main motor load, the MIKRO-MONITOR assures uninterrupted processing and greatly increased production. Easily installed, the new unit was developed specifically for use with the MIKRO-PULVERIZER, MIKRO-ATOMIZER and MIKRO-BUD, allowing any of these units to be operated for long periods without supervision. Up-date your present Mikro equipment! Write for details on the MIKRO-MONITOR.

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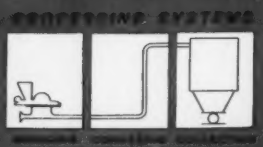
SPAN THE GLOBE

PROCESSING SYSTEMS



● Representatives in 31 countries. Write expert manager for details.

Don't Let AFDOUS Get Away With It!

Our industry has been challenged by Association of Food & Drug Officials of the United States.

Despite the name, AFDOUS is an entirely unofficial body. The challenge is made without proper cause. It is an insult to the industry. It is inimical to the best interest of consumers. It is against free enterprise. In short, the challenge must be met.

We refer to the renewed intention by AFDOUS to have enacted into legislation by the states a code of practices for handling frozen foods. Massachusetts already has obliged.

Purpose is not to eliminate a health hazard. It is to control practices affecting taste quality.

Says AFDOUS: "..the consumer receives an implied warrant of quality when she purchases packaged frozen foods."

Of course! And competition assures that she will get quality—if not from one source, then from others competing for her favor.

What's next after frozen foods?

Sad thing is that AFDOUS is not deterred even by the fact that industry has written its own good practice code.

If AFDOUS succeeds, it will be but the beginning. Already the group is moving to develop bacterial limits for frozen foods. This isn't to eliminate a health hazard, either. Frozen products have a fine safety record.

What after that? Will AFDOUS stop at frozen foods?

We have observed the growth of frozen foods from an infant in the early 30's to its present 6½ billion-lb. stature. We can testify to the achievements so capably pointed out by NAFFP's Larry Martin at the AFDOUS meeting in June.

Frozen foods have succeeded because they have pleased the "boss"—the consumer. They have done this in competition with high-quality fresh and canned foods.

Does quality of this caliber need to be protected by law?

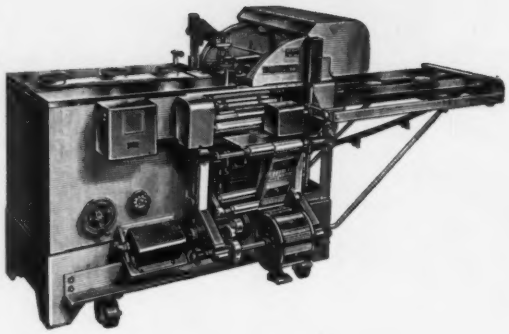
Take a look at industry's achievements

Practices in handling frozen foods have been steadily improving as new know-how and facilities have become available. Today there are 6,000 refrigerated railway cars against three in '48. Refrigerated truck trailers are being built at a rate of about 4,000 a year. Zero public warehouse space has tripled from 110 million cubic feet in '45 to 360 today. Superfrigid liquid gases are being used for precooling and en route refrigeration of vehicles hauling frozen foods. Retail display cabinets are equipped with temperature gages, in full view. Many major retail chains are rejecting shipments if the temperature is much above zero. The entire "cold chain" is headed for zero, soon.

Legislation is not needed to improve practices. See that your state legislators and governor know the facts. Stop AFDOUS in its tracks!

MODEL H-1 HOODING MACHINE

This efficient high speed hooding machine is being used in production at speeds in excess of sixty containers per minute. The straight line motion of this machine insures smooth foil container handling and uniform line flow.



EKCO-ALCOA PACKAGING EQUIPMENT is market sized

Whether the size of your market requires high speed automatic packaging equipment or low-cost manual equipment, you can get just the machine you need from Ekco-Alcoa. The H-1 Hooding Machine, for example, is a completely automatic machine engineered specifically for hooding printed light gauge aluminum foil sheet, in register on foil containers. This machine performs equally well with rectangular or round containers. Change over from one size to another is quick and easy. The H-1's simple design makes it easy to maintain and operate.

The Model II, by contrast, is manually operated, illustrating the diversity of Ekco-Alcoa packaging equipment. The operator simply places the filled container with nested cover in the base of the closure die. The foot pedal is depressed and the completed package is automatically positioned for easy removal. For specification sheets on the H-1, Model II, or other models in our equipment line, write to our Packaging Equipment Division at the address shown below.

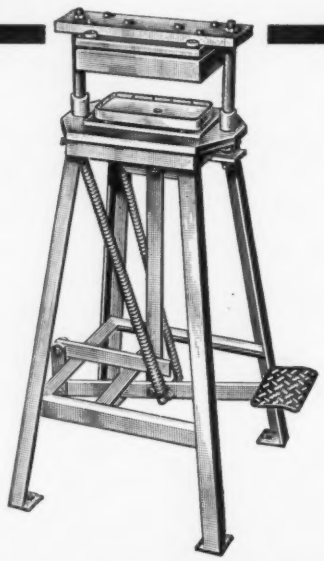
The Plus Container

EKCO-ALCOA CONTAINERS INC.
GENERAL OFFICES: WHEELING, ILLINOIS

EKCO is the registered trademark of Ekco Products Company. ALCOA is the registered trademark of Aluminum Company of America. The corporate name and combination mark, EKCO-ALCOA, is used under license by the manufacturer by each of these companies.

MODEL II

This low cost unit is ideal for market testing to determine consumer acceptance and packaging performance. The Model II is also suited for small retail operations and producers using a variety of package sizes.



FDA Plays It by Ear

FDA CONSULTANT CHIEF Carla Williams tells FE editor: "Women are more educated, more alert today. Food manufacturers must recognize this in planning new products and packages."

Network of field consultants cues agency as to consumers' wishes on food regulations, packages, and additives. Spreads FDA's views to public

BIGGER VOICE for consumer groups in the shaping of stiffer curbs on food business practices looms as a strong keynote of the New Frontier's regulatory era. The White House, Congress, and administrative agencies are all cooking up a batch of proposed "people's champion" offices.

One agency that pioneered in giving consumers a "direct line" to Washington years ago is the Food and Drug Administration. Reporting to it are 18 in-the-field consultants, whose job it is to know what's on the public mind. As Mrs. Carla Williams, personable director of FDA's consumer consultant program, puts it: "These women create a two-way flow of information between FDA and the consumer. On the one hand, they explain our program to the public. On the other, they alert us as to what new programs the public wants."

Success of FDA's consultant program has attracted other government agencies who'd like to benefit from the same kind of consumer "liaison." U. S. Dept. of Agriculture, for one, has reportedly huddled with FDA in line with Secty. Freeman's aim to set up a Consumers' Office (like the one of New Deal years). Mechanics of pushing through the Administration's farm bill have side-tracked plans temporarily, but USDA is slated to create the office in the fall after Congress adjourns.

With others expected to follow FDA's example, industry observers see the trend posing **two big challenges to food makers:**

► **Federal government's vast publicity channels will spread the anti-business criticisms of self-styled consumer champions and reformers.**

► **Food industry will find it harder to get its viewpoint across to important governmental and public agencies.**

For, as Mrs. Williams bluntly states, "Public opinion molds the law—its enactment and enforcement. And public opinion is what FDA seeks."

"You must talk to people to get a response," she

THAYER C. TAYLOR,
Associate Editor, "Food Engineering"

goes on. "A customer may not know what irks her unless she's asked about it. Thus, from what our consultants hear and see, we get a better picture of how good a job FDA is doing, whether new laws are needed or present legislation needs updating."

The director sees such programs spreading in the future. "There is a greater need for consumer education to combat the misinformation the public receives," she reasons. "And the public is hungry for information about foods: Their facts, fallacies, and fads."

To appease that hunger, FDA is beefing up its consumer consultant program. Number of consultants has been increased from 13 to 18, radio-TV is used more widely to reach a broader cross-section of the public, women's groups are encouraged to set up FDA exhibits, and special consumer mailing lists are being created—such as the one for proposed changes in food standards, for example.

No Prima Donnas Here

FDA selects the consultants shrewdly. Among the qualifications looked for, Mrs. Williams notes, are background in organization work, skill in articulating ideas, ability to weigh opinions and questions so as to sift the cranks from the serious, and above all, know-how in working with the public.

Several consultants are trained in home economics and nutrition, and eight are either full or assistant professors. Included, too, are a lawyer, a journalist, and a couple of public relations people. All of which indicates that skill in communications is no small consideration.

Tell the Fair Story

This communications skill, Mrs. Williams emphasizes, is used "to tell the fair story, not the scare story." As she explains: "The consumer consultants tell an accurate story about additives, give a positive explanation of pesticides, try to clarify the public's bewilderment regarding supplements, and offer instructions on the value of reading labels. This is an important part of their work because the public has been frightened by the misinformation which so many food faddists successfully peddle. The consumer is in a great dilemma over the fantastic claims made by many authors, radio commentators, and lecturers. These nutritional quacks slander the use of all chemicals, accuse the well-meaning food industry of 'deliberately' placing poisonous products on store shelves, and deride the FDA for 'allowing' the use of such chemicals."

Mrs. Williams stresses that the women aren't "field cops." If they see something that they feel violates the FDA law, rather than complain to the store manager or food manufacturer, they pass their ideas on to Mrs. Williams, who routes the matter to the appropriate department for follow-up. Sometimes, she observes "the suggestions open up new avenues of thought for us."

Some see FDA also using the women for "new avenues of direction." For example, it's highly likely that the consultants may be called upon for more consumer survey work in the future to help buttress FDA's legal arm.

A hint was dropped by Deputy Commissioner Harvey at the recent National Confectioners Assn. meeting. **There, he traced FDA's failure to win judicial support for the drive against deceptive packaging to "the lack of survey information that could convince the courts that the consumer was actually deceived."**

Labeling is another area where consumer surveys would help FDA. According to Mrs. Williams, "We sometimes lose lawsuits—but more often hesitate to bring them—because we are not sure what some particular labeling means to consumers."

More FDA 'Advisors'

To broaden its soundings of consumer opinion, FDA recently set up a special advisory panel, made up of reps from 10 important public groups, that reports directly to Commissioner Larrick. The groups: American Farm Bureau Federation, American Home Economics Assn., American Medical Assn., American Nurses' Assn., American Assn. of University Women, Consumers' Union, Cooperative League, National Farmers' Union, General Federation of Women's Clubs, and League of Women Voters. Group, which has already advised Comm. Larrick on Delson thin mints case and new cocoa bean standards, will be used widely in the future.

What They Think of You

From their vantage point in the field, FDA's consultants are in a good position to gage public opinion of food industry practices. And the information they're feeding back to Washington suggests areas where you would do well to review your own operation.

As put by Mrs. Williams, **here's a thumbnail sketch of what consumers are concerned about today:**

. . . **Packaging:** "This is the big complaint area right now—slack filling and deceptive containers, especially. Fancy cartons come in for a lot of comment, too. Women feel it's being overdone and they resent having to pay for it."

. . . **Labels:** "These get a lot of attention, too. Women want more information on labels, and they want it in easily understandable terms. They feel that if the product has an ingredient that shouldn't be taken by people on a salt-free diet, for example, the label should say so."

. . . **Additives:** "Women are in a dilemma over this. They know their food is safe, but they're still worried over the presence of chemicals. This may indicate that **food manufacturers haven't done enough to tell the whole story about chemicals."**

. . . **Standards:** "This is still a big educational problem. The public doesn't always understand what a food standard is, what it's supposed to do."

. . . **Nutrition:** "Much of the interest is of the inverted kind. That is, the questions are negative, such as those pertaining to quack foods."

Based upon the letters she receives and the verbal questions put to the consultants, Mrs. Williams strongly feels that the food industry should take a closer look at its information program. **"The letters and queries," she points out, "reflect the public's fears and misconceptions about the use of chemicals in foods. They deserve a clear and honest explanation.**

"This might be an area in which the industry can perform a much needed public service in further educating the public as to the safety and wholesomeness of the food supply we all enjoy today."

FDA's Carla Williams Discusses Role of Field Consultants

Q. What is the function of FDA's consultants?

A. First, by explaining FDA's regulatory program and jurisdiction, they help consumers get a better understanding of the law's protection. Second, by informing us of the public's attitudes, they help us to conduct and plan our regulatory program for today's needs as well as those of tomorrow.

Q. Must these consultants meet any special qualifications?

A. Yes. First, they must know how to work with the public, on either a lay or professional level. Some background in women's organization work, such as PTA, is helpful. And they must be articulate. Many of them are trained home economists, and eight are either full or assistant professors.

Q. How do the consultants get the information they pass on to you?

A. They send us reports on all their activities. Each talk they give before a group is followed by a question-and-answer period which reveals what is on the public's mind. When they put on exhibits for FDA they talk to booth visitors. In their contacts with the various consumer groups they act as FDA representatives. And, naturally, being homemakers themselves, they observe what is being sold in food stores.

Q. Do they get any special help from FDA?

A. We keep them updated on new developments with a monthly house organ, texts of all speeches made by FDA officials, and other explanatory literature. Once a year, they come to Washington for a 3-day briefing conference with appropriate officials.

Q. What important changes have been made in the consumer consultant program recently?

A. Our main objective is to increase the program's scope and range in public contacts. In the past year or so we have increased the number of consultants from 13 to 18. We hope to double that number in the near future. The consultants are making more use of radio-TV to reach a broader cross-section of the public. They are now working more closely with the Federal Agricultural Extension Service because of that department's interest in consumer problems.

Q. Based upon what the consultants are reporting back to FDA, how do women today feel about:

Packaging:

A. Slack filling and deceptive packaging are the big irritants right now. Women feel fancy packaging is being overdone, and they don't like paying for it.

Labels:

A. Women want labels that are easier to find, read, and understand. They want better information on them, too. Women are tired of bringing a product home and then finding out they can't eat it because it contains something they are allergic to.

Standards:

A. We get many inquiries asking what is a food standard, what does it mean. As a result, we are trying to encourage more consumer participation in the standards-making process. A special mailing list has been set up of doctors, nurses, dieticians and others who are in a position to explain what standards mean. We send them speeches and research materials, and refer them to printed sources.

Q. Do you have any message for the food industry?

A. It would be a fine public service if food manufacturers gave the public more straight facts on nutrition and food quacks. There is only so much the government can do in this area; industry can do a lot more. Manufacturers should also keep in tune with the pulse of the public. The present outcry over deceptive packaging and not-so-helpful labeling shows that women today are far better educated, more alert. Manufacturers should keep that in mind.

Advantages of Microwave Freeze-Drying

Product quality—Waves are selective for ice, thus foods dry at lower temperature. Heat damage is minimized.

Flexibility—Thick and thin items, regardless of shape, are dried with equal facility.

Greater capacity — A microwave freeze-dryer handles more product per unit volume of chamber space.

Economy — Faster process means less equipment. Eliminating hollow shelves and use of less-expensive steam ejectors cut capital investment. Use of higher chamber pressures lowers steam and water costs.

Automatic—With roll-in racks, chamber can be loaded and unloaded in a pushbutton operation.

CLOSEUP of microwave freeze-drying chamber shows random loading of shrimp on plastic trays. Pyrex cap at top of chamber vacuum-seals the magnetron generator.

How Microwaves

High-frequency energy readily penetrates even thick frozen foods, sublimes the ice without raising product temperature. Economics of microwaves are promising as an adjunct to conventional heating

MICROWAVE HEATING is showing new promise as a practical means of accelerating heat transfer during freeze-drying—particularly for removing the last few percent of moisture in a dual-energy process.

The radio-frequency technique has long been considered for freeze-drying because it:

1. Cuts processing time, thus increases chamber throughput.

2. Handles thick or thin foods with equal facility—regardless of their shapes.

3. Is selective for ice, so products dry at a lower temperature.

Unfortunately, initial work with microwaves was not entirely successful. Available generators (below 100 megacycles) caused ionization of residual gases in the vacuum chamber at the desired power levels. Reducing the power alleviated this condition, but also cut the drying rate.

However, subsequent development of high-frequency generators with reasonable cost and improved operating life has opened the door to successful freeze-drying application.

Currently, magnetron generators of 1-5 kw. capacity are available. And units under development will generate several hundred kilowatts of high-frequency energy at far less than present cost. Moreover, considerable improvement in tube life can be expected.

How Waves Speed Drying

Sublimation of ice in a food to be freeze-dried occurs spontaneously when chamber pressure is sufficiently reduced, but supplying heat to the frozen material greatly accelerates the process.

Heat conventionally applied by conduction or radiation does not defrost the product, nor does it have much effect on the temperature of that portion of the food already dried. But as the ice portion recedes, the cooling effect of sublimation is reduced and the dry material picks up heat.

Such a process is inherently slow because heat must pass through a continuously improving insulating barrier of dried product. Under these conditions, process times of 24 hr. are not uncommon.

In contrast, microwave energy passes through the dry food layer and is absorbed directly by the ice. Thus, drying can be accomplished in 6 hr. or less, while the product's dry outer layer stays cool.

Among the foods that have been freeze-dried by microwaves are: Raw and rare beef rib steaks (1-in. thick), pre-cooked haddock fillets and chicken breasts, raw jumbo shrimp, whole pre-cooked lobster tails, and whole mushrooms. Numerous other products have also been successfully handled, but the above best illustrate some of the thicker materials. All of the freeze-dried foods were of excellent quality.

About 1,200 BTU of heat are necessary to sublime 1 lb. of ice. Thus 2.8 lb. of ice will be sublimed by application of 1 kw.-hr. of energy. For a 6-hr. drying cycle, it is apparent that about

R. V. DECAREAU, Food Technologist, Thomas J. Lipton, Inc., Hoboken, N. J.

Costs for Freeze-Drying Beef Steak by Various Methods

Process	Conventional	Dual Energy	Microwave
	(cents per pound of water removed)		
Utilities	1.8085	1.5535	2.6632
Magnetron usage	.....	0.166	1.65
Labor, overhead, taxes, insurance, etc.	1.7440	1.0937	0.4590
Depreciation (at 10%), interest (at 5%)	1.4625	0.9240	0.4635
Totals	5.0150	3.7372	5.2357
Total capital investment	$241,591.00	$152,368.00	$76,655.00
Initial tube cost		$20,720.00	$18,760.00

Basis for Comparison

One inch thick beef steak, 75% moisture
Operating pressure: 1 mm.
Processing rate: 11,016 lb./day, 300 days/year.

Drying cycles:
- Conventional: 23 hr.
- Dual Energy: 11 hr.
- Microwave: 5.5 hr.

Microwave equipment:
- Tube type: Magnetron, 5-kw. rating
- Tube life: 300 hr. at rated output
- Electrical efficiency: 50%
- Tube cost: $140/kw.
- Power supply cost: $200/kw.

Utilities:
- Steam: $0.80/1000 lb. at 100 psig.
- Water: $0.02/1000 gal.
- Electricity: $0.015/kw.-hr.

Speed Freeze-Drying

6 kw. are needed for each 100 lb. of ice sublimed per hr.

Since conventional freeze-dryers may sublime as much as 1,000 lb. of ice in an 18-hr. cycle, a microwave freeze-dryer handling this load in a 6-hr. cycle would require an impractical number of 1-kw. generators. But the equipment begins to look interesting with 5-kw. generators.

A considerable reduction in microwave energy requirement is possible by using radiant heat during the early hours of the process, when there is a substantial ice load. As much as 80% of the ice may be sublimed in about half the conventional drying time. Microwave energy can then be used to remove the remainder in very short order.

Thus it appears that a dual energy process would be longer than an all microwave process, shorter than an all conventional process, and probably less expensive than either process alone.

The Equipment

The experimental microwave freeze-dryer shown above uses two 1-kw. magnetron generators of the type employed in electronic ovens.

Product trays, of special plastic construction, do not absorb microwave energy. An apparent advantage of the microwave process is that it enables much more efficient use of chamber space, since the thin trays require much less space than the hollow metal shelves used in conventional dryers. Because of the penetrating nature of microwave energy, product may be placed at random on the trays. In conventional dryers, foods must be placed uniformly on the trays to avoid uneven drying.

Sublimed ice is condensed on refrigerated coils located in a hollow steel cylinder directly to the rear of the vacuum chamber. A vacuum pump is used to remove non-condensibles.

Conventional freeze-dryers can easily be converted for microwave operation by substituting a rack of plastic trays for the usual hollow metal shelves and product trays. The plastic-tray arrangement is cheaper and easier to load, since an entire rack of frozen product can be rolled into the dryer. Conventional dryers must be loaded a shelf at a time.

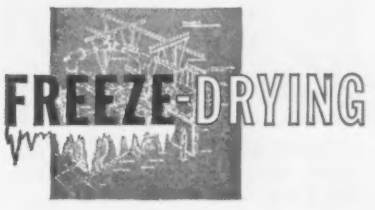
Vapor removal is better handled by steam ejectors for two reasons: (1) The fast microwave process requires removal of larger volumes of vapor, and (2) it is possible to operate at higher pressures than are typical of the conventional process.

The economics of steam ejection are especially good when steam and water are available in adequate quantities. If the refrigerated condensing system is preferred, it is best to place the condensing coils in a screened-off section of the vacuum chamber. The screen acts to confine the microwave energy in the product area without impeding the flow of vapor to the coils. Need for large vapor conductors and valves

What Are Microwaves

They are a form of radio-frequency energy generated by power tubes called magnetrons. Microwaves may be reflected, transmitted, or absorbed. Thus, metals reflect the waves; glass, paper, and plastics transmit them; and foods absorb the energy and convert it to heat.

Foods can be heated because of their high water content and large electric moment. Water molecules in an electrical field tend to align themselves with respect to the field. Since microwaves reverse their polarity over a billion times per sec., water molecules move past one another and develop considerable frictional heat.



is thereby obviated, and only a small connection to the vacuum pump is required.

Cuts Drying Costs

Our table shows a comparison of the costs of freeze-drying beef steak by various systems. This material was chosen because information was available on both conventional and microwave freeze-drying of 1-in.-thick steak. Moreover, drying of thick materials offers a challenge to the conventional process, while pointing out an advantage of the microwave technique.

It is apparent from this analysis that the dual energy system offers the most economical process. The main reasons are: (1) Less equipment is needed than in the conventional process because two complete runs per day can be made, and (2) less microwave energy is needed because it is used only to remove the last few percent of moisture.

The relatively small capital investment for an all-microwave process is somewhat misleading. Magnetrons would have to be replaced about once every 6 mos., but only once every 5 yr. in the dual-energy process. Thus, it can readily be seen that the microwave system is the more costly.

Nevertheless, there are instances when the microwave process might still be the process of choice. In freeze-drying of fish at sea, for example, space is at a premium. One microwave unit has the processing capacity of eight conventional units.

EXPERIMENTAL microwave unit illustrates typical chamber construction, tray design, and control panel.

INDIVIDUAL fish are placed in compartments of conveyor that moves them into tunnel where rotating knives cut off heads and tails. They then go to filleting section where bones and skin are removed and cleaned portions are dropped into basket.

Cuts Problem Down to Size

High-speed fish processing unit overcomes obstacles that formerly required much labor

A NEW COMPACT fish filleting machine of Swedish design has overcome many of the handicaps associated with previous attempts to mechanize this branch of the food industry.

Displacing manual work ran into obstacles presented by the peculiar properties of fish, viz., shapes, sizes, textures, structure and location of fishbones, scales, and fins.

The unit requires only two operators to feed raw fish into it, and has a capacity of 150/min., ranging from 1-15 fish/lb. It occupies 60 sq. ft. of floor space.

The machine consists of three parts:

1. Feeding conveyor with head and tail cutting device.
2. Filleting unit.
3. A separate extension for cutting and sub-dividing parts.

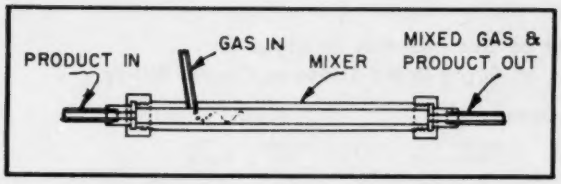
Adjustment for sizes is automatic: A special device measures the head of each fish, then automatically positions knives accordingly. The adjustment is quite precise, and the cutting is always very close to the gill covers.

The fish then enters the filleting unit where it is eviscerated very thoroughly and also filleted.

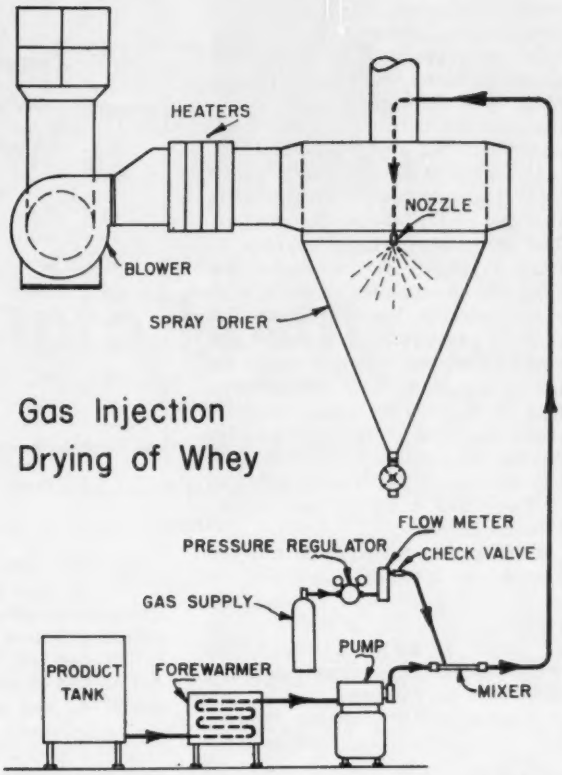
Among users of the machine is the large Scandinavian fish company, Stockholms Lans Fiskforsaljningsforening. Here, two units replaced three old German ones, giving the same output with less labor.

Machine manufacturer is The Arenco Machine Co., Stockholm, Sweden. (End)

DAVID N. LEWIN
Lewin Associates, N. Y. C.



GAS MIXING CHAMBER is heavy walled cylinder with flush-tapped orifice for entrance of gas. Cylinder can be removed from fluid line easily for cleaning.



FLOWSHEET shows how conventional spray drying operation is modified to inject 2,000-psig. gas for foam drying. Gas enters fluid line through mixer between pump and spray nozzle.

USDA Develops Foam-Spray Drying

Gas injected at 2,000 psig. expands droplets to make moisture removal easy—for cottage cheese whey and other difficult-to-dry liquids

WASTE DISPOSAL has always been a problem with cottage cheese whey. Now it is a very critical one, what with more than 3 billion lb. being produced annually in the United States.

Factories that dump whey into streams may have to discontinue cottage cheese manufacture. They may, that is, unless they can find a cheap method for disposing of the whey so that it will not contribute to the pollution problem.

Since cottage cheese whey contains approximately 93½% water, any utilization method must remove the water economically and produce a product that can be conveniently handled and shipped.

Sweet low-acid cheese whey has been dried by several patented processes. We refer to whey like that from Cheddar cheese, which at pH 6.2 has a titratable acidity of 0.13-0.15. However, cottage cheese whey at pH 4.6 and a titratable acidity of 0.55-0.60 has been difficult, if not impossible, to dry satisfactorily by conventional methods.

The large amount of lactic acid present in cottage cheese whey causes it to dry less readily and to agglomerate and form lumps in spray drying equipment. The resulting unsatisfactory product hinders the drying process by clogging the drier.

Additives, such as skim milk or cereal products, have been used as aids in drying the whey. No additives are needed with the new process. Dry cottage cheese whey can be easily and economically handled for shipment to food and feed manufacturers.

Effects of Foaming

The new process requires a

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Versatile Process

Gas-injection spray drying is being applied to other fluid dairy products. It seems especially adaptable for the drying of products from which the moisture is difficult to remove, such as high-acid liquids. It is useful, too, where large dried particles are required.

small alteration in the conventional spray process for drying fluid milk products. Compressed air is injected into the pumped-fluid line through a mixing device located between the pressure pump and the spray nozzle.

Injection of air expands the normal spray droplet, increasing its surface and lowering its density. The buoyant particle appears to remain longer in the drying air than the unexpanded particle with comparatively less surface. The foamed particle dries as a fragile eggshell type of particle which exhibits excellent flow characteristics in the drying cone, conduits and collectors. The dried powder shows no tendency to adhere to the surface of the equipment, and it flows like a liquid into collection containers.

Cottage cheese whey is concentrated in vacuum equipment to 45 to 50% solids and immediately spray dried. The characteristics of three of the fluid wheys that were successfully concentrated and dried are as follows:

Normal cottage cheese whey—pH 4.6; titratable acidity 0.55-0.60%.

Deproteinated cottage cheese whey—pH 4.6. The milk from which the cheese was made was heated to 210F. for 15 sec. The heat-coagulable whey protein (0.36% protein) was carried down with the curd, leaving a low protein whey.

Cultured cottage cheese whey—The whey was inoculated with a 2% inoculum of **L. bulgaricus** and incubated at 98F. for 24 hr. The acidity changed from pH 4.6 to 4.0. This increased the lactic acid in the dried whey from 7% to 10½%.

How Air Is Injected

The dryer was a 9-ft. Grey-Jenson unit equipped with a spray nozzle having a 0.040-in. dia. orifice. The rate of feed was 60 gal./hr. at a temperature of 130F. and a hydraulic pressure of 1,800 psig.

Key to the process for spray-drying cottage cheese whey is the introduction of gas, usually air, into a specially constructed mixer before the concentrate reaches the drier. In the experimental work, air compressed to 2,000 psig. was injected at 75F. at a rate of 1 to 1½ cfm. into whey concentrate (45% T.S.) pumped at a rate of 1 gpm. Under the conditions of these experiments, less gas than 1 cfm. resulted in powder of such high moisture that it clogged the drier.

Injection of gas before the spray produces a foam, and the relatively large surface of the foamed droplets makes moisture removal easy.

Introducing gas into the product before it enters a high-pressure reciprocating pump will cause erratic pumping if the gas is not totally dissolved. Injection of gas after the product leaves the pump, however, will permit uniform pumping regardless of the amount of gas required for foaming.

Stabilizing Powder

The dried cottage cheese whey produced by this procedure is hygroscopic. Lactic acid and amorphous lactose, both of which readily absorb moisture, are present. It must be packaged in moisture-tight containers, and partially used portions should not be unduly exposed to moisture. Moisture absorption by the powder permits lactose crystallization, leading to hardening and caking.

A stable, noncaking powder can be obtained from the dry gas-injected cottage cheese whey by using the process described here as the first drying stage. The second stage in the process consists of moisture pickup, lactose crystallization and subsequent re-drying. This can be done according to conventional procedures.

Another method for obtaining a partially moisture-stabilized powder is to crystallize the lactose in the concentrated whey and spray the crystallized suspension directly. This will produce a powder in which at least half the lactose is crystalline.

Useful Ingredient

Dried cottage cheese whey should be useful in food manufacture where lactose and lactic acid are desirable ingredients. It is a potential ingredient for sherbets, certain kinds of bakery items, soups, and other special food products. A less attractive market is as a component in animal feeds.

Effect of Gas Injection at Dryer on Properties of Spray-Dried Cottage Cheese Whey

Drying conditions					Powder properties			
	GAS INJECTION		DRYING AIR TEMPERATURE					
Sample	Gas used	Pressure (psig)	In (F.)	Out (F.)	Moisture (%)	Crystalline lactose (%)	Particle size (microns)	Physical properties
1a	air	2,000	265	200	1.3	21	112	Free flowing
1b	none		270	200	2.2	30	60	Lumpy on cooling
2a	air	2,000	255	190	2.0	30	114	Free flowing
2b	none		260	190	2.6	45	57	Caked on cooling
3a	air	2,000	248	180	1.3	32	125	Free flowing
3b	none		250	170	2.6	34	54	Lumpy from dryer
4a	air	2,000	240	165	2.4	35	129	Free flowing
4b	none		240	165	4.2	37	55	Caked before cooling

NOTES: Moisture determined by toluene extraction. Crystalline lactose determined by x-ray diffraction. Particle size is average of 10 microscopic fields.

NOTE—Part of the data in this paper were presented at the 56th Annual Meeting of the American Dairy Science Association, June 14, 1961.

Acknowledgment—The authors wish to acknowledge assistance from their colleagues: Manufacture and processing cottage cheese whey by the pilot plant groups of the Dairy Products Laboratory at Beltsville and in Washington, under the leadership of H. E. Walter. Whey fermentation and determination of lactic acid by R. E. Hargrove. Analytical work by the Milk Concentrates Group under supervision of M. J. Pallansch. Determination of crystalline lactose by x-ray diffraction, by L. P. Witnauer and D. A. Lutz, EU.

Characteristics of Spray-Dried Cottage Cheese Whey

Composition	Normal whey (%)	Cultured high-acid whey (%)
Protein	11.5	11.5
Lactose	71.5	68.1
Lactic acid	7.0	10.5
Ash	8.0	7.6
Moisture	2.0	2.3
Acidity (pH)	4.4	3.9

NOTE: Density of dried whey relative to water was 0.30–0.40. Average equilibrium relative humidity for powders = 25%.

PRES. FELTON aims to double Green Giant's sales ($68-mil. last year) in next 5 yrs., and has strong program for boosting profits.

Putting Zip Into Profits

Green Giant, which more than doubled its sales the past 10 yrs., plans same success for earnings. Firm's 5-point program has important tips for your forward planning

GROWTH MINDED Green Giant is out to make the new decade the Profitable Sixties. And the company's 5 - part recipe for this has important tips for your own profit-building program.

Company's growth pattern was pretty impressive during the last decade, even though sales gains ran pretty far ahead of earnings. Between '50 and '60, GG's annual volume more than doubled—from $31-million to $64-million — but profits trailed along with a 56% gain—from $1.1-million to $1.8-million.

Looking ahead, Pres. L. E. Felton says company aims for "an annual after-tax profit of 10% of invested capital." In recent years, he adds, level has been around 7½%. Fortune magazine, incidentally, estimates that the industry-wide average last year was 8.9%, a slight comedown from 1959's 10%.

Behind GG's profit goal is a 5-point program that includes:

- **Tight cost controls.**
- **Plant modernization.**
- **Two-phased R&D expansion.**
- **Integrated long-range planning.**
- **Product diversification.**

Focus on Profits

Felton says a big contribution to firm's earnings is a thorough cost analysis program.

Company sets up, before each season, three hypothetical production targets for each vegetable, then figures out which program mix (based on variable factors) will give the greatest profit. System is worked out on electronic computers.

To meet predetermined profit goals, up-to-date reports are continuously submitted from each of 25 processing plants located in 8 states and 2 Canadian provinces. This way, company can make daily adjustments.

Recently, system was refined by use of direct costing methods and a developed standard cost employed as a measuring yardstick. Heretofore, company depended solely on past experience.

A pack projection is no longer based on quick liquidation at going price. Introduced, instead, are profit plans based on year 'round selling to give company better control over its pricing.

To avoid being whipsawed by widely fluctuating agricultural supplies, on the one hand, and relatively inflexible markets, on the other, company's marketing division initiates pack plans by indicating requirements. Production schedules are keyed to normal yields, then controlled according to advance plans. When the pack is in, amount to be marketed prior to ensuing production run is fixed. This may require a "carry-over" or purchase of additional quantities (to maintain shelf position and market share). By following this procedure, company liquidates stocks in an orderly manner.

Paired with the company's belt-tightening on costs is a capital expenditures program that channeled $1,824,545 into plant modernization last year. Also, at least 7 low-profit plants have been closed down.

Among the units contributing to better product quality as well as lower costs are continuous cookers, cream-style corn equipment, and fill control machines. Installation of units for liquid sugar is saving storage area, reducing the danger of infestation, and pruning required labor. The company's own Florinator has been refined for more uniform proportioning of onions and peppers.

More efficient stacking of bright cans, and greater use of palletizing-depalletizing equipment, has led to better use of plan facilities. And by maximizing the use of available storage space, techniques have helped to curb warehousing costs.

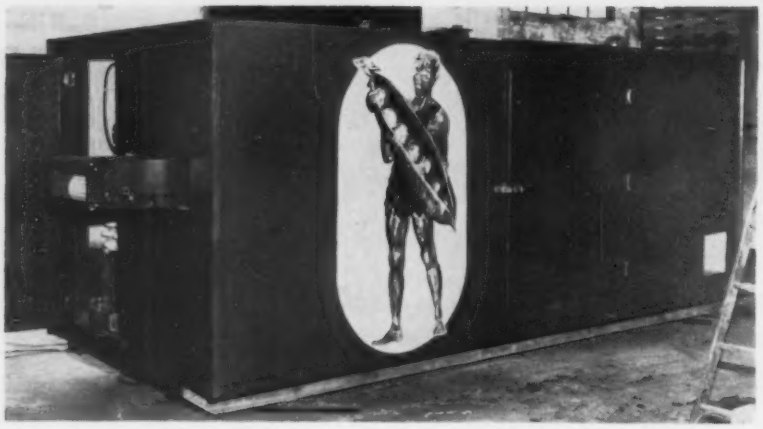
Mechanization has been extended to the farming area, too, where hand labor is at a premium. Working with equipment makers, GG has helped develop 8-row corn planters and 8-row cultivators that cut in half the manpower formerly required.

Farming operations have also been shifted to assure more even flow of raw produce to individual plants, thus promoting better quality control. Objective here is to make possible concurrent packing of different items, thus reducing unit costs.

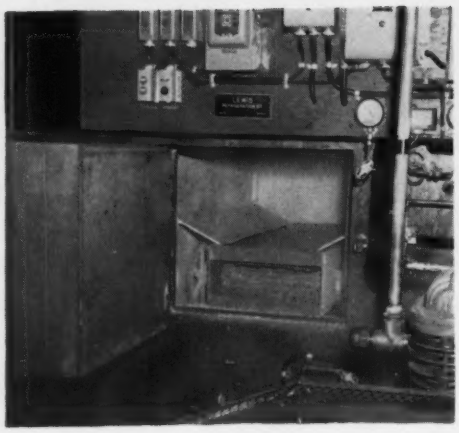
Green Giant carries out continuous research in two areas. One, called "insurance" research, aims to secure profits by minimizing

JOHN V. ZIEMBA, Senior Associate Editor, "Food Engineering," Chicago

Smoother New Product Development .....



TECHNICAL RESEARCH figures importantly in GG's profit drive. Pilot freezing tunnel, installed last summer, has self-contained refrigeration system, two separate belts for loose-freezing.



BELT carries container through pilot model. Product is precooled, then quick frozen at low temperatures.

costs, increasing production capacity, and maintaining superior product distinctiveness and quality. The other one, called "growth" research, assures future profits through development of new and distinctive products, processes, facilities, markets, services, and strategies.

Even Split

G. C. Scott, vice president-research, says R&D budget is divided 50-50 between agriculture and processing research. In the future, new product research will be expanded. Stimuli, Scott points out, are the 300,000 edible plant varieties, turned up by ag research, of which only 300 are widely grown and only a dozen are popular.

R&D chief looks to significant development in the introduction of a great number of mixed vegetables, improved methods in dehydrating and freezing, and breakthroughs in improving color and flavor of preserved vegetables. Mushrooms, he feels, will be an important food of the future because they provide bulk (to diet) and are a rich low-calorie source of protein.

In the agricultural area, Green Giant believes it spends a bigger portion of sales on seed breeding than any other canner. Some 15 ag scientists are forever "marrying off" different varieties of corn, peas and vegetables with one another to produce more desirable canned products. Before a hybrid seed is considered desirable, it must show a high yield per acre, produce 75-80% fancy grade at harvest, and be distinctive in taste.

As a result of the research, 47% of GG's early peas and 89% of its sweet peas last year were from new seed strains not commercially available 3 yrs. before. And 85% of company's yellow sweet corn acreage was from strains introduced just 4 yrs. ago.

Company's best insurance against crop failure is the wide geographic spread of its farming operations. This also helps to level out crop supplies needed for canning so as to minimize variations in raw materials costs. Furthermore, plantings in each canning area are carefully scheduled so crops reach maturity in orderly sequence without heavy burden on packing plants.

Ready for Long Haul

Pres. Felton figures his company has a good chance to double its sales in the next 5 yrs. To bring that hope closer to reality, firm last year set up a new Corporate Planning Div. (headed by Vice Pres. R. C. Cosgrove).

As Felton sees it, **"Planning is the foundation of successful management, and growth is closely related to the amount and quality of your planning."**

FROZEN PRODUCT is checked before being placed in walk-in freezer. New tunnel enables product development dept. to step up work on product improvement as well as uncover new items.

CPD's main job, of course is to uncover areas where GG can grow most profitably, either with present or new products. Both short- and long-range plans are drawn up as objectives.

Cosgrove stresses the critical need of evaluating all critical factors involved in planning expansion. Thus, any proposed venture is evaluated in the light of projected unit sales, prices, costs, return, capital investment, product development charges, and marketing and cash generated. Overlook-

ing any of these factors, he warns, means big-scale headaches later on.

Diversifications Keyed

A big ambition of GG's long-range planning calls for a broader product line. Aim here is to spread the risks involved when prices of one of its two big items weakens, as well as achieve faster rate of growth from new items.

Company's two big products, corn and peas, scored substantial gains in the past decade—a growth that's brought the company to a point where it is increasingly difficult to make further gains. President Felton figures GG's canned corn and peas hold between 15 and 25% (depending upon product) of total market for these items. About 50% of company's sales are from corn, 40% from peas. As a result, any slump in retail prices pinches company's profits. Hence the need to diversify.

Firm has already expanded into green beans and asparagus (which now account for 10% of sales). More recently, GG acquired Michigan Mushroom Co. to put itself, for the first time, in a business other than canning vegetables.

Latest expansion move is into frozen foods. Plans call for marketing a highly profitable line of frozen vegetables nationally within the next 5 yrs.

Years ago, company found it could pack good frozen peas and successfully sell them under the Green Giant label. But with intense price competition at the time spelling slim profits, GG dropped the tests.

Planners have devoted considerable interest in specialty foods yielding higher profit margins. Typical is the firm's Le Sueur line that includes such items as tender white corn and small fancy peas blended with imported onions. Company is looking for new products (like potatoes) to include in its specialties.

Smart Marketing Helps

GG's promotions of its premium priced products are financed through appropriation of a fixed amount per case of advertised brands packed—a policy carried out each year regardless of temporary market conditions. Sometimes the company initially overspends when marketing a new product.

Business is conducted with about 90 brokers in 44 states, with the firm's own field sales force serving as liaison between these brokers. Institutional sales, which the company intends to promote more heavily, are also made through brokers.

OVERSEAS MARKETS are new GG target. At first, peas will be exported from Canadian plants to England to bypass duty charges. Long-range plans call for production plants in Europe.

Growth of supermarkets forced the company to revise its former policy of liquidating left-over production at sacrifice prices. New policy is geared to fulfilling supermarkets' 30-day supply through additional warehouses thus permitting inventory to be carried throughout the year.

A variety of brands have been created to cope with the special problems posed by variable weather and growing conditions. As every canner realizes, even with the best controlled planting schedules and harvesting, you can't get all your products harvested at the moment of best quality. GG allows for this by using different brands for different product grades.

For example, top quality Green Giant, Niblets, and Le Sueur labels get most of the harvested peas and corn. Extra standard pack goes under Kounty Kist, while lowest grade (standard) items appear under the Little Crow brand.

An extensive market research program, augmented by services of outside firms, helps keep product planning on target. Case in point is the step up in the promotion of Le Sueur brand peas (presently most popular in East and South) in the West and Midwest. Basis of this decision was the marketing staff's findings that West Coast preferred medium-sized instead of large-sized peas. By subsequently test marketing a tender, medium-sized pea in this area, sales in the first year increased sizably.

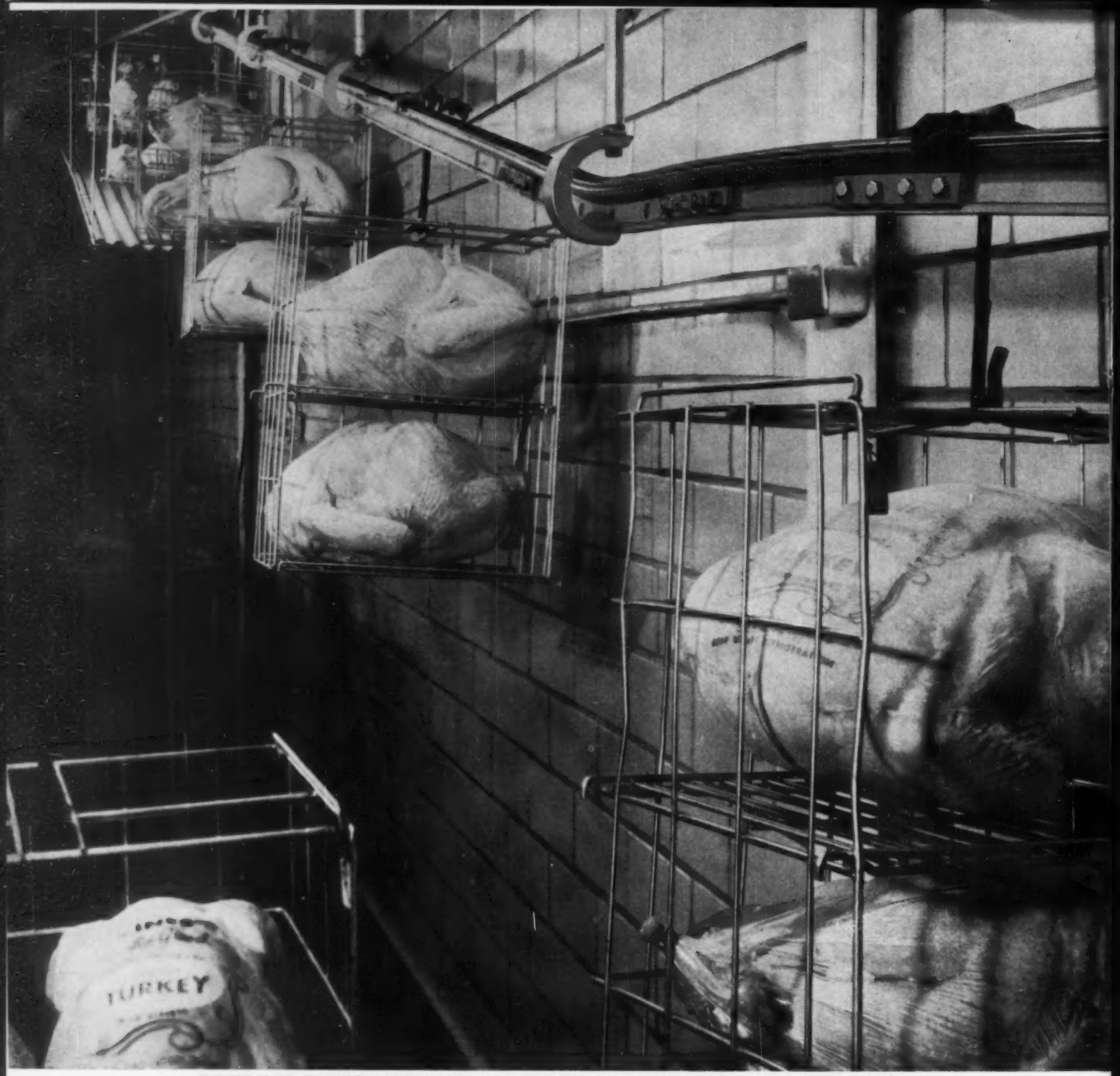
Company also recently introduced a superior mushroom under the Le Sueur label for test marketing in high sales potential areas. Moreover, it's experimenting with cocktail mushrooms and mushrooms in various sauces.

Venture into the mushroom field was taken after a 5-yr. study that shows it to be one of the fastest growing foods in popularity, with sales climbing at a rate of 8% annually.

Another recent step is an expansion into foreign markets. First invasion is in the south section of England. Company feels, after almost a year of surveying European and African marketing and production facilities, that Britain is a good starting point because of lack of language barriers and the fact that the British are heavy buyers of canned goods that can be shipped duty free from GG's Canadian affiliate.

While Americans expect and get high-grade corn and peas, such standards have not been developed overseas. And, in the case of corn, Europeans tend to look on it as food for cattle.

By applying GG's know-how in seed breeding, growing, harvesting, canning, and marketing to foreign operations, Felton is confident of success. Meanwhile, a rising standard of living in such places as West Gemany will lead people to demand better peas than now sold in these countries, he argues. (End)



TURKEYS TRAVEL TO FREEZING ROOM ON SPIRAFLEX WHERE THEY FLY FROM THE CEILING TO DOUBLE STORAGE SPACE

Cherry-Burrell magic makes frozen turkeys fly

The wizardry of Cherry-Burrell engineers was recently challenged by Mr. Ed Vines, of Vines Poultry Company, Osgood, Indiana. He needed a continuous method of freezing his turkeys, but had limited floor space and wanted to do it economically. He investigated a number of possible methods. But they all were either too costly, or took too much room, or both. That's when Ed Vines talked turkey with Cherry-Burrell.

To solve the problem and increase his profits, Cherry-Burrell engineers put frozen birds on the wing. They recommended a Cherry-Burrell Spiraflex overhead conveying system on which to fly his turkeys through his freezing room. This gave him two rooms in one: a freezing tunnel on the ceiling; a holding room on the floor. And he needed only one refrigeration system for both. Freezing room labor, and of course, labor costs were eliminated. The more efficient use of existing equipment spread refrigeration costs over a broader base; made this money work twice as hard. And the over-all plant output was increased. Now this turkey processor's birds are quickly frozen, white, plump and profitable.

Highly trained technicians will test *your* product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing.

Call or write Cherry-Burrell today.

A COMPLETE LINE OF CONVEYING EQUIPMENT

Spiraflex, Wheel, Belt and Roller conveying equipment types are available from Cherry-Burrell. Write for complete details.

CHERRY-BURRELL CORPORATION

CEDAR RAPIDS, IOWA

Tips to Management

Unions aim at food industry

. . . Buyer's new image . . .

Benefits hike in '62

Unions Eye Food Industry

Recent moves by both the AFL-CIO and the Teamsters Union indicate that future labor activity in the food industry will be anything but calm.

Federation's recent Executive Council confab formally created a food and beverage department "to promote the interests of workers in the food processing and service industry." Nine unions were enrolled in this superunion, which is already in strategy formulation stage.

Rival Teamsters' Miami convention foreshadows a concerted campaign by Hoffa men to boost activity at all levels of the food industry, from farming to processing to retailing.

Teamsters recently gained a foothold in the growers industry by signing a contract with several hundred farm workers in Salinas, Calif. On the same front, the AFL-CIO abandoned its 2½-yr.-old attempt to organize California agricultural employees at a reported cost of $500,000.

Profits and the Purchasing Agent

The purchasing man does play an important role in company profits and should receive management recognition for doing it, according to S. E. Spencer, Jr., General Foods' director of purchasing.

Spencer told the buyers' convention that wherever purchasing is managed by competent profit-minded men, the question of recognition doesn't exist. He points to food industry cost of goods statistics as indicative of purchasing's place in potential profits and cites Corn Products' 77% of net sales, Swift's 92%, Hunt Foods' 78%, and GF's 66% as typical. Since value added by manufacture is rather small in this industry, he emphasized that the opportunity for the buyer to contribute to profits should be obvious to every management.

According to Spencer, GF expresses a 3% reduction in the cost of things bought as the profit equivalent of an 18% increase in sales.

Benefits Cost Boost in '62

If you've got any bargaining sessions coming up, don't forget the new Social Security legislation which will result in an additional $18 in employee fringe benefits next year.

Increase for more than 4.4 million workers will be paid by raising the tax on employers and employees. Present 3% deduction covering the first $4,800 of earnings is expected to move to 3⅛%—an additional cost of $6 to company and employee.

Congress also passed a temporary program to increase unemployment compensation from 26 to 39 weeks. This means your tax will jump from 3.1% to 3.5% on the first $3,000 of earnings for two years beginning in January '62—an extra cost to you of $12 per worker.

Whither Armour Experiment?

Subjects under discussion during present negotiations between Armour and the unions include the future of the Armour Automation Committee. Reports are that both parties have indicated a disposition to continue the company/union Committee through the term of the next contract. Present agreement ends Sept. 1.

Committee's recent progress report (FE July, p. 45) was anything but 100% compatible in view of union's need to issue a separate report. Probably one of the most important lessons learned from the group's efforts is that a "crash" program for job retraining is not the main answer to unemployment in the meatpacking industry. If at all useful, officials feel retraining must be a long term effort and not just an "out" in times of crisis.

Price of an Employee Publication

If your company doesn't already include an employee house organ in its communications effort (See Special Report, p. 57), here's an actual example of what it takes to produce a bi-monthly handed out to 1,300 workers. Using a newspaper format, 11⅜x14½ on 72-lb. white paper, this 8-page publication is printed black and white on letterpress. Estimated costs are:

Printing	$700/issue
Paper	15
Engravings (average)	50
Artwork	15
Photography (by employees)	Free
Office supplies	10

Balance of costs will depend on your own estimates of such items as office space (9x12-ft.) and office equipment (desk, table, 4-drawer file cabinet, typewriter, and telephone).

Publication's one editor also handles other communications duties. Correspondents for company news are provided in various departments or divisions.

← CIRCLE 42 ON INQUIRY CARD

VERSATILITY of new microcrystalline cellulose (Avicel) is demonstrated by the wide variety of calorie-reduced foods that can be made with it. Typical are baked goods, desserts and toppings, dressings, and dry mixes.

Crystalline Cellulose: Versatile New Food Ingredient

It converts oil-based foods and syrups into free-flowing granular products, forms stable gels with 20% or more of cellulose solids, and provides built-in calorie control

PROCESSORS have been busy checking the unique ingredient properties of a patented form of cellolose—a microcrystalline product sold as "Avicel."

Unlike the natural celluloses, this material is non-fibrous. And when reduced to a specific particle-size range, it assumes colloidal properties entirely different from those of fibrous cellulose, starches, cellulose gums, and natural gums.

Thus, the product opens the door to a host of new food products and applications:

1. In dry form or as a gel, this non-caloric cellulose offers a new approach to calorie-control of a wide variety of foods. For the first time, enough of this material can be incorporated into a product to effect significant calorie reduction — without impairing the food's palatability or appearance.

2. Dispersed in water, the material produces stable gels containing up to 20% or more of cellulose solids. And such gels are readily spreadable. At lower concentrations, creamy colloidal suspensions are obtained.

3. In dry form, the product acts as an efficient absorbent. Thus it can convert oil-based foods (cheese, peanut butter) and syrups (molasses, honey) to free-flowing granular forms for use in dry mixes and convenience foods.

Avicel* was discovered by Dr. O. A. Battista, Manager, Corporate Applied Research, American Viscose Corp. Since its original announcement (FE Nov. '60, p. 115), some 1,000 food processors have requested samples of the material.

The first food products to contain Avicel are expected to be available to consumers this fall.

American Viscose's present semi-commercial production of the cellulose is a million pounds a year. But the company, encouraged by food-industry response to the material, will put a new plant on stream the end of this year.

Current cost of the material is 60¢/lb. in 100-lb. lots.

Not a Food Substitute

Judicious addition of this microcrystalline cellulose to a high-calorie food is seen as an effective means of reducing its caloric content without depriving the consumer of essential nutrients.

Medical authorities advise that the best way to lose weight is to continue to eat a well-balanced diet, but less of it. This method enables gradual weight reduction and conditions the dieter to a reduced caloric intake which will

LEONARD TRAUBERMAN
Associate Editor, "Food Engineering"

** Registered trademark of American Viscose Corp.*

maintain optimum weight permanently.

However, many people find it difficult to stay on a slow-reducing diet—hence the popularity of the 900-calorie preparations. But even the best quick-reducing technique is inadequate in at least two respects. It denies the dieter the pleasure of partaking in normal meal-time activities. And it does little, if anything, to condition him to permanent calorie reduction.

In contrast, the new approach would permit eating a well-balanced diet—but with built-in calorie control. This can now be accomplished by incorporating a sufficient amount of microcrystalline cellulose into certain high-calorie foods to achieve the desired calorie reduction. The total amount of cellulose consumed per day would be a relatively small percentage of the total diet.

Unique in Two Ways

Here is how Avicel differs from natural and conventionally purified celluloses — the key to its unique applications:

First, this microcrystalline cellulose is non-fibrous.

When any applicable amount of fibrous cellulose, even in a pulverized state, is added to foods, it acts as an inert filler that doesn't blend properly. For example, it imparts a grainy texture to puddings or salad dressings. Moreover, fibrous cellulose doesn't form stable thixotropic gels of smooth consistency.

As a result, fibrous cellulose has had relatively limited use in foods, primarily where its fibrous nature could be camouflaged by natural fibrous components. This disadvantage has now been overcome by the microcrystalline cellulose product.

Secondly, the new form of non-fibrous cellulose consists of colloidal aggregates having a narrow particle-size range.

Until now, cellulose has existed as two extremes on the dimensional scale. In the form of soluble derivatives, it dissolves in water so that individual molecules are substantially molecularly dispersed. On the other hand, fibrous cellulose contains relatively large individual fibers, or mats of fibers.

However, the microcrystalline aggregates are reduced to a particle size primarily below 40 microns, and preferably below 5 microns. Moreover, a significant number of the particles are well under 1 micron.

Here are some of the many product applications:

PEANUT BUTTER, made dry and free-flowing by incorporation of microcrystalline cellulose, can easily be sprinkled on a slice of bread.

As a Gel

When microcrystalline cellulose aggregates are dispersed by wet attrition at 32-36% solids content, the larger ones rapidly break down to produce particles with dimensions of one micron or less. This can be done efficiently in a Mixmaster or a Hobart mixer in 3-5 min. The result is a relatively thick, white paste that readily forms a gel upon dilution with water.

Degree of thixotropy, viscosity, and opacity of the gels depends on the manner and duration of attrition, and the extent to which microcrystalline particles in the sub-micron range have been produced.

With such gels, it is possible to prepare colloidal spreads having up to 20% solids or more. In contrast, the water-soluble cellulose gums, starches, or natural gums cannot produce a flowable colloidal system in which the solids content exceeds 1 or 2% without causing gelation of the mixture. Moreover, the resultant rubbery gels are not spreadable.

The new cellulose gels are particularly useful in the formulation of smooth food products, such as dressings, various spreads, dips, sauces, and aerosol-type toppings. At higher solids contents, the gels have the physical characteristics of natural animal fats or of hydrogenated vegetable oils—and without any fatty acid components.

For example, vegetable oils and fats normally used in products similar to mayonnaise or salad dressing can be partially replaced with Avicel, thereby reducing their caloric values by 50% or more.

Furthermore, the physical appearance, taste, and texture of the calorie-reduced product is not appreciably different from that of its conventional counterpart.

Standard equipment, such as a

How Avicel Is Made

This new microcrystalline cellulose is made from a special grade of highly purified fibrous cellulose by a chemical process, one step involving acid hydrolysis.

Impurities and amorphous materials are removed during processing. The resultant non-fibrous product consists of clusters of microcrystalline aggregates. Degree of agglomeration is carefully controlled because physical and functional properties of the product, both in dry form and as a gel, depend on particle sizes and particle-size distribution.

The material can readily be used in conventional food processing, inasmuch as its physical form is similar to existing food ingredients. A basic composition of matter patent (U.S. Patent No. 2,978,446) has been issued to American Viscose Corp.

Chemical and Physical Properties

Composition	Microcrystalline cellulose
Molecular weight	30,000-50,000
Equilibrium moisture, % (58% R.H.-72°F.)	4-6
Organic extractables, %	0.03-0.05
Ash, %	0.02-0.06
Calcium, ppm	40-60
Magnesium, ppm	5-10
Silica, ppm	2-20
Iron, ppm	10-20
Copper, ppm	2-6
Manganese, ppm	0-2
Absolute density	1.55
Bulk density	0.30-0.80
Average particle size, μ	10.50

Solubility

Water	Insoluble, dispersible
Dilute alkali	Partially soluble, swells
Dilute acid	Insoluble, resistant
Organic solvents	Insoluble, inert
Oils	Insoluble, inert

milk homogenizer, can be used to make the cellulose gels on a continuous basis. In manufacture of ice cream- and spread-type product, ingredients can be mixed and passed through the homogenizer continuously. Resultant products are free of any fibrous or gritty characteristics.

By combining the gel with an edible oil or fat, and using the proper dispersing agents, calorie-controlled foods that taste like and look like sour cream, hollandaise sauce, and cheese dips can readily be prepared.

Palatable dietary custards and puddings can be made by controlling the Avicel content of the product. Such puddings would have all of the necessary nutritional and mineral components, in line with the 900-calorie/day dietary concept. And their superior opacity provides white, attractive gels in the untinted state.

Pre-homogenized aerosol preparations, such as toppings, can be made with excellent body, spreadability, and stability.

NEW DESSERT TOPPING has about 4 calories per serving, in contrast to 17 calories per serving for conventional low-calorie toppings.

SPREADS similar to mayonnaise and salad dressings, but with about half the calories, can be made by partially replacing the oil component with non-fibrous cellulose.

In Dry Form

As supplied commercially, the dry product resembles flour. It is easily incorporated into foods which are to be pre-homogenized, such as toppings and frozen desserts.

The dry microcrystalline cellulose is uniquely suitable for a host of baked goods.

Tasty fruit-flavored cookies that do not contain any flour, added fat, or sugar can be made with it. These highly edible cookies have the appearance and palatability of ordinary cookies, but are reduced at least 50% in caloric content over a conventional cookie made with flour, sugar, and fat.

Aside from its usefulness in dietary cookies for general weight control, Avicel offers a new food ingredient to the over 3,000,000 diabetics in the U. S. alone. Dietetic cookies currently available lack the non-carbohydrate ingredient necessary to give them desirable eating and taste qualities.

The process by which microcrystalline cellulose is made produces, on a submicroscopic level, many fissures and holes in the dry particles. This structure gives the aggregates unique absorbent properties, particularly for fatty materials. This property makes it possible to convert oleaginous or syrupy products into dry, free-flowing forms.

In this application, product to be dried is placed in a suitable mixer and agitated at low speed. The cellulose is added slowly until a mix of the desired dry, free-flowing texture is obtained.

A particularly attractive way of using the dry cellulose is in formulation of butter-flavored mixes which, upon addition of water and stirring, produce smooth butter-flavored bread spreads. By use of flavors other than butter, cheese spreads and other flavored spreads may also be prepared.

Natural, non-toxic dyes—whether water-soluble or oil-soluble—can be absorbed by the microcrystalline aggregates. The cellulose containing such dyes may then be used to carry edible dyes into fat-based products, such as butter or margarine, without causing 'speckling' or blooming in the product.

Since many of the oil-soluble dyes have been barred for food use, this application may well prove helpful for coloring fatty foods with water-soluble and non-toxic natural vegetable dyes.

In its dry form, cellulose can be compressed, forming durable shapes which rapidly disintegrate in water. Thus, it can be used in preparation of pre-measured or pre-weighed products such as wafers, cubes, or tablets for dispensing accurately measured amounts of active ingredients.

A water-Avicel paste can be extruded into ribbons and other shapes. In spaghetti, noodles, and macaroni products, the cellulose could have a functional role over and above that of calorie control.

Frozen Desserts

In frozen-dessert preparations that simulate ice cream, a substantial amount of cellulose solids can now be incorporated to reduce greatly the formation of ice crystals. Such frozen desserts can be more readily thawed and re-frozen. In addition to being much lower in calories than conventional ice cream, they have superior dimensional stability. And the bulking role of overrun in ice cream can be controlled by microcrystalline cellulose.

The new frozen desserts are less chilling in the mouth upon first contact. Control of ice-crystal formation during freezing and thawing should also be useful in preparation of popsicle-type products, including the chocolate-cov-

ered stick-type frozen confections.

A recent court decision in California was favorable regarding the use of non-nutritive materials, which are generally recognized as safe, in confections. This offers most attractive possibilities for use of Avicel in all types of candy. Currently, the product can be used in dietary type 225-calorie candy bars and similar confections. The court ruling, if sustained, would permit the use of microcrystalline cellulose in confections that are not specifically intended for dietary purposes.

The oil-absorbency characteristics of the dry cellulose also offers advantages for use in meats and meat products. Used on the surface of bacon, it curbs curling and prevents sticking of the sliced strips during storage. As a coating on each side of hamburger patties, it helps prevent loss of some of the juices and reduces shrinkage.

Another possibility for use of the cellulose in meat products would be by the housewife, restaurants, and institutions. For example, it could be added to ground meat for preparation of meatloaf dishes, to homemade sauces, etc.

The product can also be used as a vehicle for absorbing oily seasonings or flavor components, and for carrying such materials into processed meats. This is permissible provided the amount of microcrystalline cellulose used is not sufficient to adulterate the product.

Considered GRAS

FDA is of the opinion that Avicel is 'generally recognized as safe' and, therefore, is not subject to clearance provisions of the 1958 Food Additives Amendment. At present, it may be used only in products without standards of identity. Proper label declaration should describe the ingredient as "Avicel Microcrystalline Cellulose (Non-Nutritive)."

Over the years, tests with animals and humans have shown that ordinary fibrous cellulose is harmless, even when used at much higher levels than is contemplated for Avicel. The only current toxicity data on the product are based on extensive animal-feeding studies. They show material to be harmless and not to impair the availability of vitamins and minerals in the diet.

How It's Used

The following formulations are indicative of the types of low-calorie foods that be made with the new cellulose.

Salad Spread

Ingredients	%
Avicel	11.53
Sucrose	9.44
Salt	2.20
Dry mustard	.11
Mono Sodium Glutamate	.01
Vegetable oil	6.00
Vinegar distilled	10.00
Lemon juice	1.26
Algin gum	.31
Instant Starch	.21
Distilled Monoglyceride	1.05
Water	57.89

Attrite Avicel in Hobart for 25 min. at 33% solids. Disperse starch and alginate in remaining water (hot), then combine with attrited Avicel. Add combined monoglyceride and oil. Blend in sugar, mustard, MSG, vinegar, lemon juice, and salt. Mix well and homogenize, color to suit.

Frozen Dessert

Ingredients	%
Sucrose	12.00
Non-fat milk solids	10.00
Avicel	6.00
Corn syrup	5.00
Fat	4.00
Chocolate flavor	4.00
CMC (7HP)	.07
Emulsifier	.07
Water	58.86

Dry mix the sucrose, NFMS, Avicel, corn syrup, chocolate flavor, and CMC. Melt fat and emulsifier together and dry to free flowing crumb with the above mix. To water (90C.) in hopper, add dry mix using Lightnin' mixer. Homogenize well dispersed ingredients at about 1,000 psi.

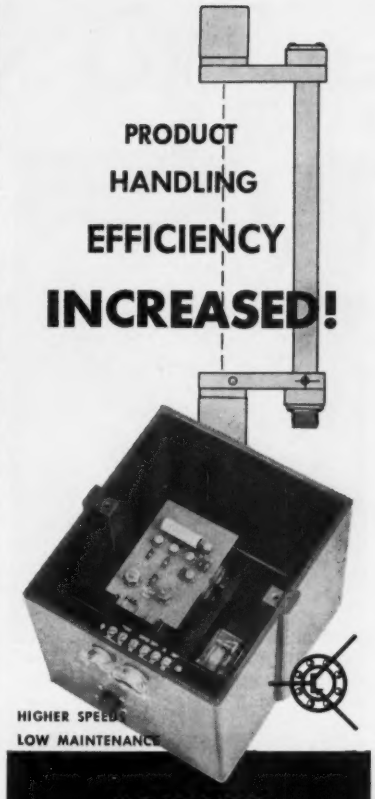
Aerosol Topping

Ingredients	%
Avicel	10.00
Fat	8.80
Sucrose	10.00
Soy Protein	.50
Water-in-oil emulsifier	.30
Oil-in-water emulsifier	.01
CMC (LP)	.30
Salt	.02
Water	70.07

Flavor and color:

Synthetic butter vanilla flavor	5 drops
Lemon oil	½ drop
Color: 1% soln. of .83 parts yellow #5 and .17 parts yellow #6	5 drops

Combine melted fat and emulsifiers, then dry blend with Avicel, sucrose, soy protein, CMC, salt, flavor, and color. Add dry mix to water at about 85C. and disperse well with mixer. Homogenize at 1,000-2,000 p.s.i., cool the mix and load into containers.



GENISCO TRANSISTORIZED CONVEYOR CONTROLS

Get the most in efficiency and reliability from your conveyor system with these new Genisco Electronic Conveyor Controls. Utilizing the electronic industry's most advanced transistor circuitry and modular construction, Genisco Model OC1100A Electronic Conveyor Controls reduce maintenance costs and provide higher speeds for greater productivity. Genisco solid state electronics eliminate many of the potential trouble points of mechanical controls. Add savings in time and operating costs to your product handling with Genisco Electronic Conveyor Controls.

- Completely transistorized
- Cast aluminum housing with moisture proof seal
- No warmup, instant start
- Adjustable, stop and start time delays
- Modular construction for quick checkout, easy maintenance
- Sensing head - control box connecting cable up to 1000 ft. long.

OPTICAL SENSING HEAD

Completely moisture sealed . . . Long life source lamp . . . Pre-aligned light beam for precision control . . . Rugged all-aluminum construction, stainless steel hardware.

Genisco INCORPORATED

2233 Federal Ave., Los Angeles 64, California

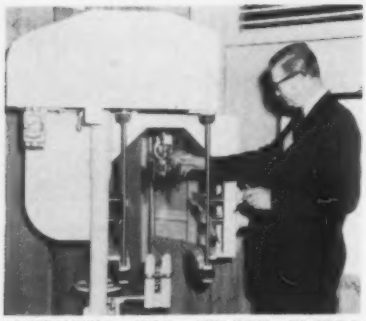
16 Units for Process

Level controls, packaging units, proportioners, scales, separators, dust collectors, and product handlers share spotlight at Operative Millers' show

ELECTRONIC LEVEL CONTROL, with sensor mounted on reel-fed steel tape, provides continuous indication and control for bin loading - unloading.—Rolfes Electronics, Boone, Ia. **(336)**

TRIM-WEIGH SCALE handles 10-12 bags (100 lb.) per min. Conveyor is scale platform. Electric eye cuts off trim-feed vibrator for 2-oz. accuracy.—Bemis Bro. Bag Co., Minneapolis. **(339)**

ELECTRONIC SCALE'S load cell positions remote dial indicator. Unit operates digital indicator, adding machine, punch tape, printweigher, or batching controls.—Toledo Scale Corp., Toledo, Ohio. **(340)**



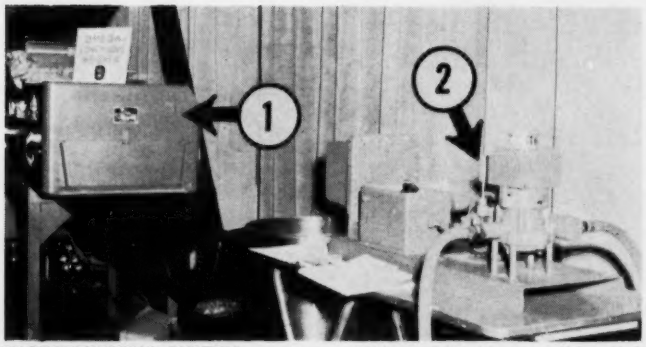
AUTOMATIC BAG FOLDER - CLOSER (50- and 100-lb. units) has air-operated fingers and vertical pressure plates to complete fold and eliminate slack.—Oslo, Inc., Minneapolis. **(337)**

DUST COLLECTOR is available in two designs: (1) plenum with bags projecting into bin; (2) plenum and housing (no hopper) mounted on bin.—Pulverizing Machinery, Summit, N. J. **(338)**

CONTINUOUS TESTER indicates or records bushel weights of grains. Flow through quart container (center) actuates weigher. — Henry Simon Ltd., Cheadle Heath, Stockport, Eng. **(341)**

NEW SIFTING PRINCIPLE is vibrating air column that keep screens clean, also minimizes blinding and product attrition. Unit adjusts for product density.—Allen Bradley, Milwaukee. **(342)**

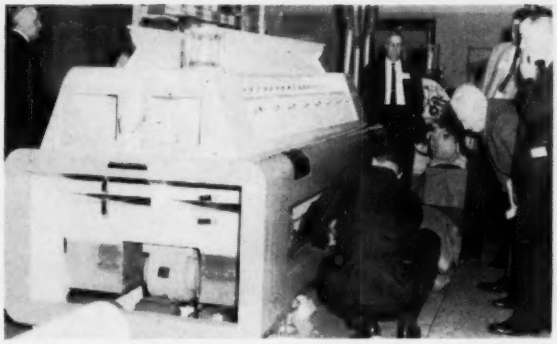
Efficiency . . .



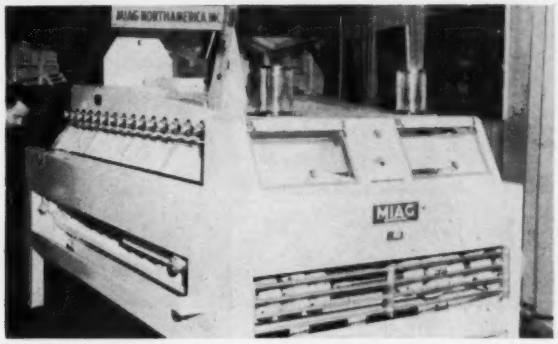
PROPORTIONING SYSTEM monitors addition of liquids to solids. Belt weigher (1) senses variations in solids flow, sends correcting impulses to motor of liquid-metering unit (2).—B-I-F Industries, Providence, R. I. **(343)**

IMPACT MILL with fan and hammermill-type impeller features peripheral screen for greater screening area. Unit mills products in single pass.—Universal Milling & Machinery, Ltd., Ottawa, Canada. **(344)**

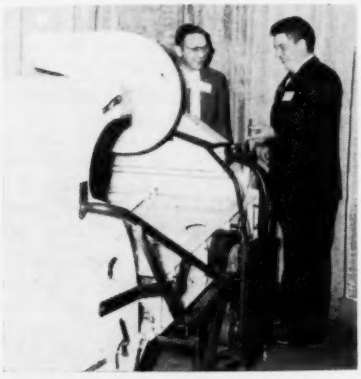
3 Efficient Separators



ALL-METAL PURIFIER'S self-balancing feeders distribute product uniformly over sieves with single or multiple decks. There are four outlets for middlings or semolina, and tail outlets depending on number of sieves.—Smico-Morros, Oklahoma City. **(345)**



DOUBLE PURIFIER has two sets of double sieves with covering and automatic tilting brushes. Also featured: Rotary air regulation valves connected to central aspirator, internal electric lighting, single or double shaking troughs. —MIAG, Braunschweig, Germany. **(346)**



VIBRATION-FREE SCREEN needs no floor bolting. Its circular motion (900-2,000 rpm.) creates tumbling action on fine and scalp screens.—Fred Forsberg & Sons, Thief River Falls, Minn. **(347)**

4 Other Highlights

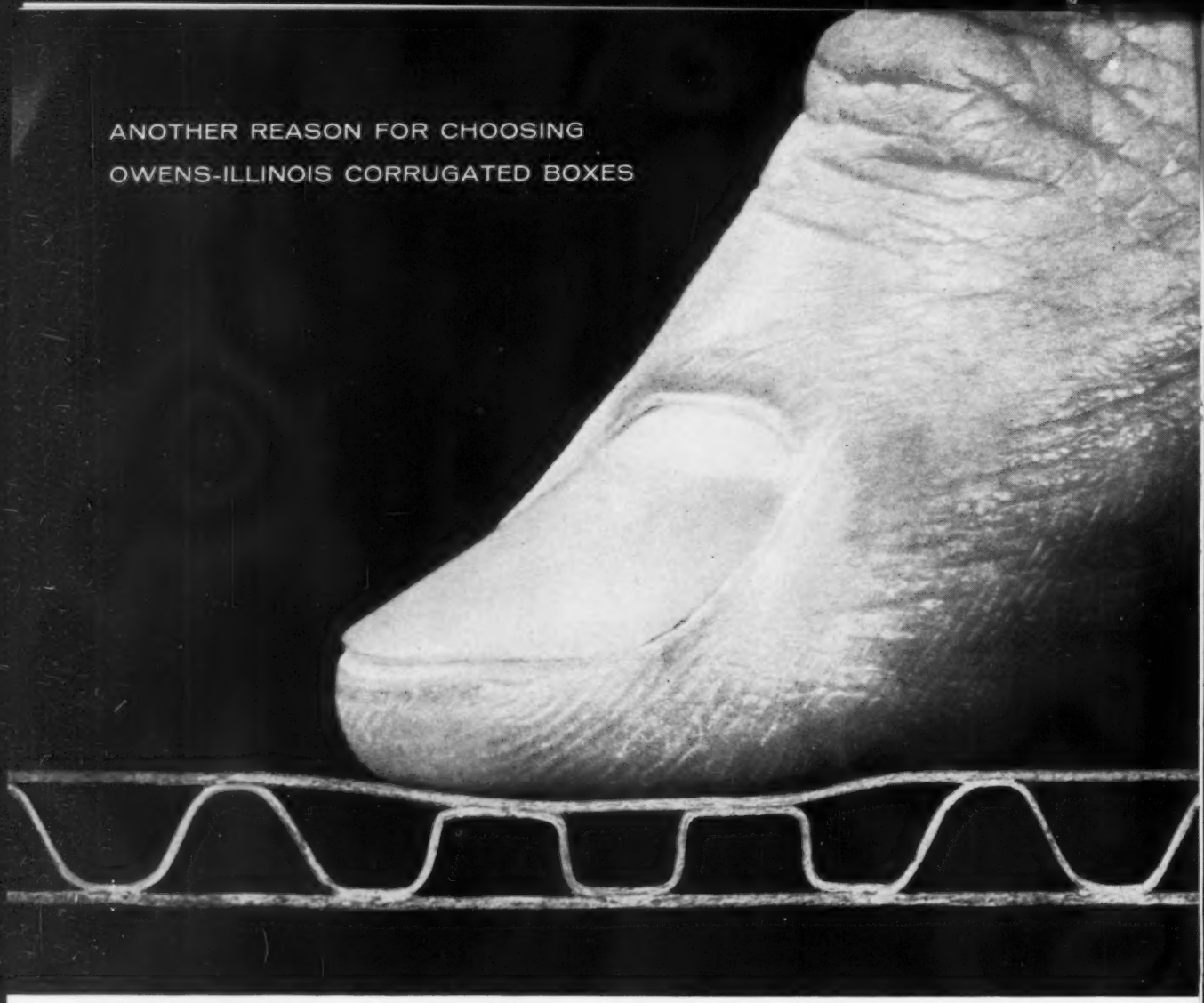
★ **CONTINUOUS BLENDING SYSTEM** automatically monitors addition of small amounts of material to larger quantities in response to formula changes.—B. F. Gump Co., Chicago. **(348)**

★ **BULK-HANDLING SYSTEM** fluidizes fine materials by air pressure. Automated setup comprises pump, storage bins, pneumatic and gravity conveyors, blenders, dust controllers. — Consolidated Engineering Co., Houston, Tex. **(349)**

★ **LAB-TYPE MILL,** an automatic self-contained unit, employs fixed corrugated rolls for multiple grinding. Unit handles samples down to 20 g.—C. W. Brabender Instruments, Inc., S. Hackensack, N. J. **(350)**

★ **NO-RESIDUE FUMIGANT** (hydrogen phosphide) controls most grain insects and their pre-adult stages. Product (Phostoxin) comes in tablet form.—Degesch, Frankfort am Main, W. Germany. **(351)**

For more data, circle item number on Reader Inquiry Card, back of book



MR. STRONGBOX

How Owens-Illinois put more muscle in its corrugated boxes

LOCALIZED SERVICE FROM:

Atlanta, Ga.	Long Island City, N. Y.
Aurora, Ind.	Los Angeles, Calif.*
Bradford, Pa.	Madison, Ill.
Bristol, Pa.	Memphis, Tenn.
Chicago, Ill.	Mercedes, Texas
Dallas, Texas	Miami, Fla.
Detroit, Mich.	Milwaukee, Wis.
Flint, Mich.	Minneapolis, Minn.
Jacksonville, Fla.	Newark, N. J.
Kansas City, Mo.	Oakland, Calif.*
Salisbury, N. C.	

*These plants are operated by National Container Corporation of California, subsidiary of Owens-Illinois.

After five years of research, Owens-Illinois has redesigned C-flute, a standard corrugated arch, to make it stronger than any previously available.

For corrugated-box users, this new C-flute means: 1) greater protection of your product because of increased resistance to crushing, 2) a more rigid board, 3) more positive folding during assembly, and 4) fewer high and low areas, resulting in better printing.

Secret of the new C-flute is a structural change in the corrugated arch which gives it substantially greater flat-crush strength. Result: a better box at no extra cost to the user!

Let us talk to you about how C-flute can benefit *you.*

PAPER PRODUCTS DIVISION
FORMERLY NATIONAL CONTAINER

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

Practical Ideas

Unique Compacting Truck Speeds Pea Processing

For its "shelled-at-the-plant" frozen pea operation, Lamb-Weston developed this time-saving truck body which compresses pea vines automatically without damage.

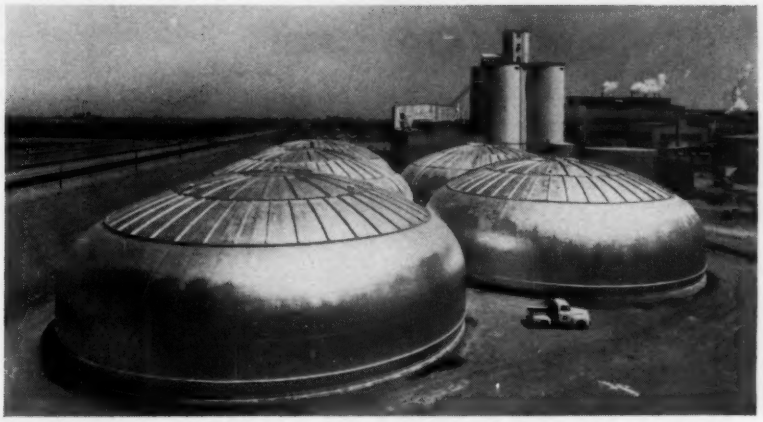
In Lamb's operation at Weston, Ore., pea vines are trucked directly to the plant for shelling, grading, and freezing, which require about 20 min. from dump time. Normal field loading calls for three or four waiting trucks to take partial loads, while a loaded truck is being "defluffed" to accommodate more peas on the vines. Often, a single truck must go beneath the loader three or four times to load.

With the compressor body, however, a truck can stay with the loader and be "defluffed" by operation of an hydraulic handle that causes the sides to compress the vines. Thus, only one truck now waits for loading. The new method takes about 10 min. compared to 30 min. for the old.

Moreover, hillside loading—always a problem with regular trucks—is easy with this one. Its uphill side panel can be lowered, while the downhill panel is left vertical. This eliminates roll-over danger from unbalanced loading. Upon arriving at the viner line, the truck gently shove-pulls the load to the viner slab by means of "drapers" on the bed. Vines immediately "refluff" themselves, making fork-lifting into the viners a simpler operation than with the former high vine compression.

The company, which has patents pending on the truck body, feels that other concerns with similar compressible products may find this development of interest. This year's operation will provide a rugged field test of design and efficiency.

◄ CIRCLE 50 ON INQUIRY CARD



GIANT SPHEROID TANKS are key to Holly Sugar Corp.'s new 'thick-juice' storage system—which extends sugar-beet processing 50-60 days.

Extends Beet-Processing Season 50%

Ingenious handling of sugar beets has upped Holly Sugar Corp.'s production capacity 2,100 tons a day.

Company officials estimate that their new system can double a plant's output at about half the cost of a new factory. Complete information on the technique will be made available to all US beet-sugar processors.

The new system, now in full operation at Holly's plant near Brawley, Calif., provides temporary storage for partially refined sugar juice. In contrast, sugar-beet processing had always been a continuous operation from raw material to refined sugar.

Significantly, the juice-storage technique extends the refining phase of beet processing 50-60 days. Thus, the total sugar-making season no longer has to coincide precisely with the beet harvest—a period of 90-100 days.

Although attempts have been made to lengthen the processing season by storing beets in the field, this has not proved entirely satisfactory. And in areas where the harvest extends into July, the hot weather precludes such storage. However, the partially refined juice can be stored without deterioration.

During the harvest season, about two-thirds of the beets entering Holly's plant are processed immediately into granulated sugar. The rest are carried only to the "thick-juice" stage (about 70% sugar) and stored for later processing.

For this storage, Holly uses five specially designed semi-spheroid steel tanks. Each plastic-coated unit is 102-ft. dia., 40-ft. high, and can store 1,850,000 gal. of thick juice. Other facilities include a complex instrument-control system, a new lime kiln, and greatly enlarged sugarbeet receiving and "slicing" equipment.

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CIP Pointers

Turbulent flow of detergent solution is vital to efficient in-place cleaning of food processing equipment. Recent research at the U. of Calif. also indicates that temperature of the cleaning agent and use of suction instead of positive pressure are important factors.

Turbulence in CIP systems may decrease in dead ends or in large-diameter pipes to the point where sections are not properly cleaned. Operators can compensate for this by increasing the amount of detergent used, its temperature, or the period of circulation.

Higher temperatures generally improve cleaning efficiency, except when certain detergents are used. The polyphosphates and some of the organic wetting agents decompose under heat. Otherwise, speed of cleaning is doubled for every 22½-deg.-F. increase.

Bleeding air into the system promotes a scrubbing action and faster cleaning. However, any buildup of foam cushions the surface and slows cleaning. Cleaning efficiency was measured by using a film of milk containing a radioactive tracer.

Pneumatic Unloading Speeds Corn Delivery

An unique pneumatic conveyor automatically unloads corn from trucks to a storage bin at La Fiesta Mexicatessen, Sacramento.

Structural limitations at the processing plant were overcome by bringing the discharge pipe right up through the center of the bin. Corn is blown against an inverted cone built into the ceiling of the bin. The grain bounces off the cone and is distributed in a neat circle, filling the bin evenly. Latter is about 19 ft. in diameter.

Pneumatic conveyor has a vacuum nozzle at the end of a flexible hose. This permits the operator to reach every corner of the truck without walking in or on the corn. The nozzle improves sanitation, eliminates dust hazard to the operator, and empties the truck without waste.

Air-conveyor lines from truck to bin are tightly sealed to maintain a definite air balance. Equipment has a minimum of moving parts, and none in the area where the operator would usually work.

The conveyor system was supplied by *Sprout-Waldron & Co., Muncy, Pa.*

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CIRCLE 53 ON INQUIRY CARD →

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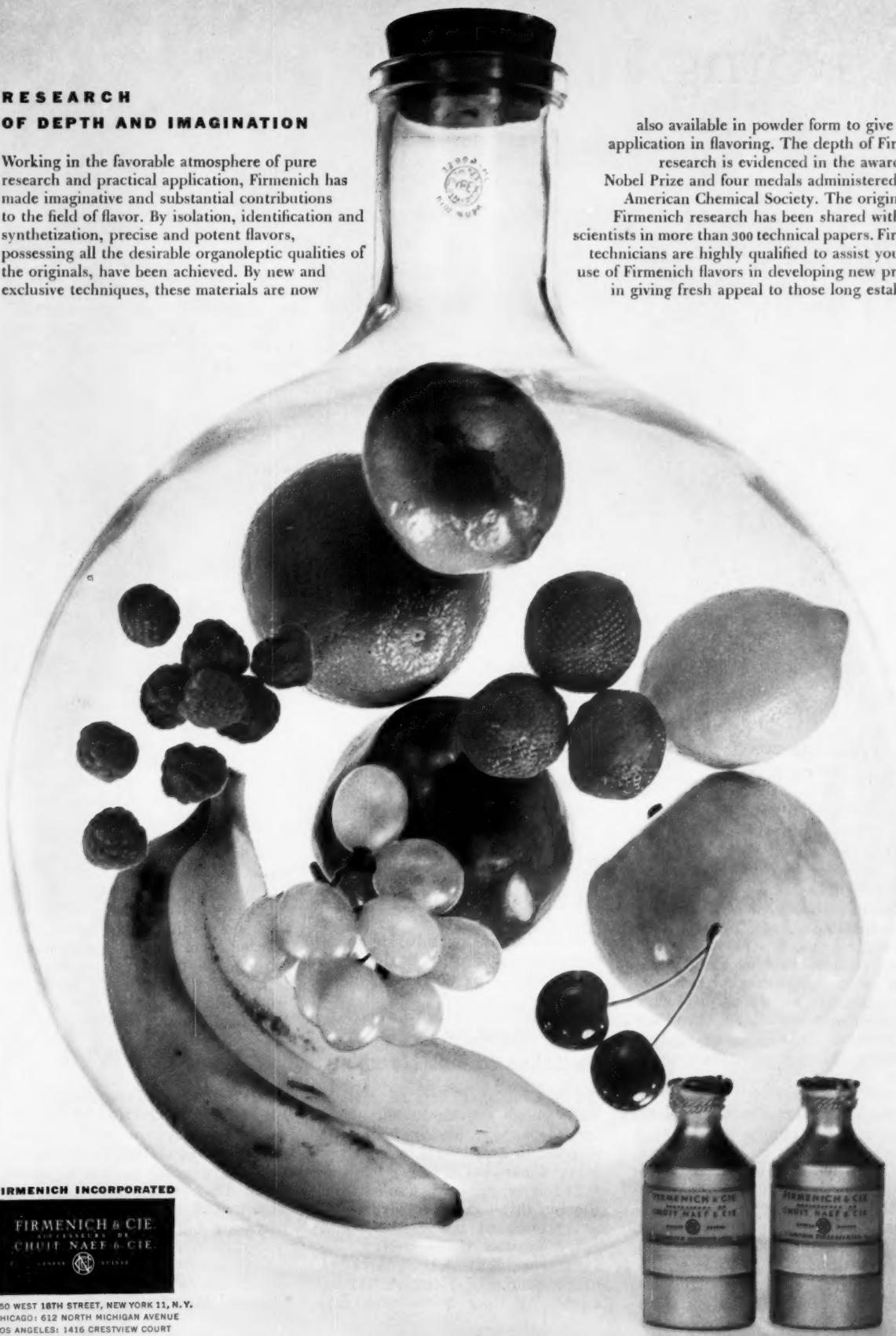

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Doing It Better

ELECTRONIC PLUG BOARD, shown being inserted into master-control unit, monitors the batching of dehydrated-soup ingredients. Product formulas are set up on these boards.

CORN PRODUCTS CO.

Monitors Soup Production Electronically

Electronics play a key role in controlling both the quality and processing efficiency of Corn Products Co.'s new American line of seven dehydrated soups.

Heart of the automated production system at Argo, Ill., is a master-control panel (photo) which monitors the batching of the various soup ingredients. Product formulas are set up on electronic plug boards which, in turn, are introduced into the production process. They control the amount and delivery rate of each ingredient.

Moreover, the control panel receives a continuous feedback of product data, which is printed out as a permanent record. This information is continually matched with standard recipes. As additional checks on product quality, subjective and laboratory test are run continually.

A central operator controls the entire process. By merely pushing a button, he can start or stop any production line. Should malfunction occur anywhere along the line, production is stopped automatically and the trouble spot is immediately indicated on the master panel.

The batching-control system was supplied by Hardy Scales Co., Maywood, Calif. **(201)**

GLACIER GROVES, INC.

Switches to Bulk Handling

This Cincinnati firm has nearly doubled its weekly receipts of fresh orange juice by having it shipped in a 4,000-gal. rubberized fabric tank.

Formerly, juice was hauled from Florida in 50-gal. steel drums by a refrigerated truck that could carry only 52 of them. Now, the same truck delivers the equivalent of 80 drums of juice. A 'throw-away' film liner in the tank prevents juice contamination.

Juice is pumped directly from tank-truck to storage tanks. The truck returns to Florida loaded with drums in which frozen concentrate had been shipped by rail.

The fabric tanks are made by Goodyear Tire & Rubber Co., Akron, Ohio. **(202)**

Borden Co., Dixon, Ill., guards hygroscopic milk powders by handling them in special bulk containers between 'instantizing' and packaging. Engineered by Tote System, Inc., Beatrice, Neb., the 90-cu.-ft. bins also cut operating costs, simplify sanitation. **(205)**

Minute Maid Corp., Auburndale, Fla., curbs oxidation of orange juice by processing in a protective nitrogen atmosphere. A continuous oxygen analyzer monitors the headspace, actuates a valve to expel the nitrogen should its oxygen content rise above 0.5%. Analyzer is available from Beckman Instruments, Inc., Fullerton, Calif. **(207)**

Grill Meats, Inc., Sandusky, Ohio, has eliminated the problems of lubricant freeze-up and excessive wear on a chain drive in a −30F. freezer room. It now uses a chain with 'self-lubricating' stud bushings of Delrin. Unit is made by Hewitt-Robins, Union Chain Div., Stamford, Conn. **(208)**

Minter Brothers, Inc., Bridgeport, Pa., speeds production of starch-molded confections with a compact continuous unit. In sequence, goods are cast, solidified, separated from the starch, cleaned, and discharged. Simultaneously, trays are refilled for next casting operation. Automatic system, which handles 20 trays per min., is offered by Cantab Industries, Toronto, Canada. **(209)**

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Photograph of the Parke, Davis Company kitchen in Detroit, Michigan.

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CIRCLE 55 ON INQUIRY CARD

DICALITE®

TECHNICAL REPORT

DICALITE DEPARTMENT • GREAT LAKES CARBON CORPORATION • 612 SO. FLOWER ST., LOS ANGELES 17, CALIFORNIA

Two Dicalite Filteraids Prove Out Best On "World's Largest" Rotary Vacuum Precoat Filter

Left to right: John Murch, vice-president and chief engineer, and general manager Bob Ashby, discuss the filter operation with Bob Barber, Dicalite service engineer.

In the A. F. Murch Company plant at Paw Paw, Michigan, the "world's largest" rotary vacuum precoat filter —an Eimco, 8 feet in diameter and 20 feet long—filters 5,000 gallons of fruit juice an hour through a 5-inch thick precoat of Dicalite filteraid. We are told that only 7 filters this size are in existence, and only this one in the fruit processing industry in this country.

This giant filter was chosen because Murch desired a filter cycle which matched the operating cycle of their evaporators. These operate continuously for 36 hours between cleanings.

Norm Roger, Murch director of research and quality control, works with Barber on filteraid evaluation for new strawberry product. Barber is using a Dicalite Rotary Vacuum Precoat Test Leaf.

The filter cycle length and the desired throughput were the basis for calculating both the size of the filter and the required thickness of the precoat.

Final filteraid evaluation tests extended over 6 months, during which Dicalite and other filteraids were checked for throughput, clarity, cake shrinkage and cracking. Two Dicalite filteraids were chosen—Dicalite 372 (diatomite) for grape juice, and Dicalite 476 (perlite) for apple juice, which requires a higher polishing. A new Dicalite perlite filteraid, 4156, has also been tested and is scheduled for use in 1961.

A major factor in the selection of Dicalite perlite filteraids was their lighter weight—20% less than comparable filteraids of other types—which permitted the buildup of required cake thickness. Even so, the 5" thick precoat takes over 1½ tons of filteraid, dry weight, which rises to between 4 and 5 tons when wet.

Murch processes nearly 4 million gallons a year of grape juice, apple and cherry juice into high density concentrates and volatile esters and is now testing Dicalite filteraids for use in a new strawberry product.

Robert K. Barber

Dicalite's "Man on the Spot"

When Barber started working with Murch on this filtration problem, over two years ago, no such filter set-up had ever been used in the industry. It was recognized from the first that a very large filter would be required, with a precoat much thicker than usual.

Barber's assistance in solving Murch's problem started with preliminary filteraid evaluations using the Rotary Vacuum Precoat Test Leaf developed by the Dicalite product laboratory. From these tests, Murch began extensive experimentation on a pilot plant scale, counselling with Barber as work progressed.

All the variables in rotary vacuum precoat filtration were thoroughly checked during the tests conducted by Murch and Barber. Dicalite filteraids were found most suitable in all desired characteristics—clarity, flowrate and freedom from cracking and cake shrinkage.

In addition to assisting Murch, Barber serves Dicalite users in many industries across a five-state wide territory, east and west of Chicago.

TECHNICAL LITERATURE

on Dicalite Filteraids is available on request. Bulletin B-14 discusses the principles and operating practices of filteraid filtration, and its applications in many industries. Write for your copy to Dicalite Dept., 612 So. Flower St., Los Angeles 17, Calif.

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'Human Engineering' in Action

Top food industry communicators aim for better employee cooperation, efficiency, and productivity. Their techniques can help you improve your company's climate of industrial relations

YOUR BUSINESS FUTURE may well depend on the results of your present program of employee communications. This need for effective "human engineering" is not only important, it is becoming increasingly urgent.

According to a recent study by the National Industrial Conference Board, it is a rare attitude survey that does not show the need for more employee information.

Today's employee is faced with a growing number of changes that are affecting his way of life and your business life as well. In management's forced need for automation progress to meet the profit squeeze, the worker sees himself victimized by new technology. He's losing his place as an individual in the organization and, consequently, his loyalties for the organization.

With so much change in the air, keeping employees tuned-in on management's thinking is vital. Department heads, foremen, and employees must understand where you are going and why. Good communication can help rekindle the worker's interest in his job, his loyalty to the company—and you can move ahead in business competition free from internal frictions and stumbling blocks.

There is, of course, considerable disagreement as to just what is meant by a good communications program—and even more disagreement as to the best way to operate such a program. Many industry executives feel that communications is a method of conduct as much as it is a formal program. In essence, it is concerned with people working together effectively to provide a climate where communications flow freely in all directions.

Before you tackle the job of building a communications program for your company—or making your present program more efficient—you must study, analyze, and then plan. Keep in mind that today's workers want to know about things that affect them. If not given accurate information, they may develop wrong ideas and attitudes concerning issues that can have an immeasurable effect on your own company.

What are these issues? To name just a few, they include automation, productivity, union representation and negotiations, pay scales, the guaranteed annual wage, employee benefits, politics, economics,

FE Staff

etc. These are the things that most progressive managements in the food and beverage industry must successfully communicate to their employees in addition to regular needs such as quality, safety, and efficiency.

Tools and Techniques

How can these factors be communicated? Certain formal techniques are used by many companies. (See panel charting the Media of Communication.)

Written approach is traditional and has proved to be the most popular. Advantages claimed for written include accuracy, permanence, coverage, and retention.

More and more companies, however, are emphasizing the oral approach to communications, which includes these advantages: Personal, two-way, flexible, effective, and fast.

Whatever techniques you choose, be prepared to overcome a variety of barriers that may inhibit effective communication. Potential roadblocks may stem from management reasons such as lack of policy or indifferent management; from organizational reasons such as decentralization or too many levels of management; from mechanical reasons such as lack of proper equipment or wrong use of media; or from psychological reasons such as fears and prejudices.

Of course, failure to understand the real interests of employees may cause your program to miss the boat entirely and become a waste of time and company money.

To find out what is being done to overcome these barriers and produce worthwhile communications in your industry, FOOD Engineering's editors queried several communications leaders in the food and beverage industry. The issues that they are attempting to get over to their employees —plus the tools and techniques they are using to do it—may help you to produce better profits through better communications.

"Informed Work Force"

Miller Brewing's industrial relations chief, R. A. Makowski, views the objectives of his firm's program as an aid in building a cooperative and informed work force. Specifically, it's geared toward reduction in unit labor costs, more efficient use of capital, and improvements in competitive position.

"Supplying employees with the necessary, day-to-day information and spicing it with more thought-provoking, educational material has been our avenue of pursuit against poor attitudes, departures from reality, and half truths," states communicator Makowski. He sees this technique as helping to "create favorable employee attitudes and thus avoid petty grievances, unauthorized work stoppages, slow downs, resistance to technological change, careless work, waste and efficiency, hostility toward management, reliance on unions, and higher production costs."

To carry out this goal, Miller incorporates bulletin boards, publications (weekly newsletter, bimonthly magazine), and letters to employees. Of these, Makowski rates publications and bulletin boards equally important. "Publications," he points out, "provide greater scope and reach a larger audience than bulletin boards. However, the boards are considered completely adequate to reach active employees with official pronouncements."

At Miller, the trite, but all-encompassing term, "employee attitude," is seen as the major problem to which a good employee communications program can be put to use effectively. Says Makowski: "Specific programs, such as automation, wages, productivity and efficiency, come to grips, ultimately, with the attitudes of employees. Major task is to mold an attitude of acceptance and receptiveness to new programs which are in line with company goals and of benefit to all employees."

A glance at the brewer's employee publication, "Miller High-Lites," illustrates firm's program in action. A two-page article entitled "So You Want To Own a Brewery," explains to employees the need for advertising, quality, and cost cutting in the Miller operation to meet competition and

Ten Myths that

Ten Commandments that should be forgotten by good management are highlighted by Opinion Research Corp. Here are the myths and truths as interpreted by ORC:

1. "Most employees aren't interested in their company—only in trivia or news about themselves and their friends."

TRUTH: Employees are interested in any subject that is explained in terms of its effect on them. A recent survey noted that 71% wanted information about wages, hours, and working conditions. Some 69% wanted to know about job security. There is solid evidence that "personals" are greatly overrated as fare for employee magazines.

2. "When it comes to communicating with employees, unions have the inside track."

TRUTH: The writer who has the inside track is the one who has the most significant story to tell, and who tells it best—nobody else. Moreover, when all else is equal, the employee may well be more inclined to believe the company than the union. In a test of company vs. union publications, one plant's employees voted 82% to 56% as believing the company.

3. "If you want people to read your message, you have to keep it short."

TRUTH: Very few people like to wade through unnecessary verbiage. But they want the facts that are important to them, whatever the number of words involved.

4. "Management should avoid controversial issues."

TRUTH: The fact is that employees are vitally interested in what management has to say about things that will affect them. They accord to management the same freedom of speech that they accord to the union.

5. "All you need for a good company magazine is plenty of money for staff and production."

Limit Communication

TRUTH: Money can help make a better magazine only if it is correctly used. Content is incomparably more important than format. Magazines with big budgets and lavish color work often score less impressively than much simpler publications.

6. "You can judge the effectiveness of a piece of reading matter by the number of people who are willing to pick it up and carry it away."

TRUTH: Unfortunately, there appears to be little or no relationship between pickup figures and readership. Most of us will pick up any reading matter that costs us nothing. Whether we read it or not depends on what is inside.

7. "Gimmicks, such as trick headlines or elaborate analogies, are needed to build readership for serious material."

TRUTH: On the contrary, a "gimmick" often confuses instead of clarifies the point you are trying to make.

8. "A picture is worth a thousand words."

TRUTH: A picture is not necessarily worth even one word. Its value depends on whether it is properly chosen to emphasize the point of the article. A poorly chosen picture simply distracts the reader.

9. "Simple, understandable treatment of serious material is 'talking down,' and therefore is offensive."

TRUTH: Nobody wants to be patronized; but to state an idea simply and clearly is not to patronize—it is to show respect for the reader's intelligence and his time. Executives appreciate having ideas expressed to them clearly and straightforwardly—and so do employees.

10. "We don't need to talk about that subject; we covered it last month."

TRUTH: Not everybody is going to read everything you sent out. If you want to make a lasting impression, you must see that it is read not once but many times. The best-read magazine we have tested was read by 66% of a company's employees; but even then only 53% of the employees read the best-read article.

Source: "Ten Myths That Limit Management's Ability to Communicate" Opinion Research Corp., Princeton, N. J.

make the 'team' secure. In the same issue, the editor graphically compares Miller wages and benefits with the national and local average.

Borden's Bulletin Boards

If you're faced with the problem of communicating with a large number of plants, take a tip from The Borden Co.—and do it with bulletin boards.

Although the big dairy firm has no over-all company magazine, many of its divisions and regions publish house organs for employees in their own particular divisions. The Chicago Metropolitan Region, for example, publishes "Borden Circle News," a large format magazine pegged for interest in that region. In all, some 15 separate house organs are published to maintain employee communications on the local level.

In place of the company-wide magazine, Borden makes extremely effective use of its Bulletin Board Service. Editor A. E. Beresky feels the boards are doing roughly the same job that internal house organs do in other organizations.

Service, instituted in '48, is designed to:

1. **Broaden employees' knowledge** of their company's products, importance to the public, relation to the national economy, and organizational structure.

2. **Increase employees' sense** of identification with their company and, as a by-product, strengthen their idea of the company as a good place to work.

3. **Carry service messages** for employee's guidance and information: Safety in plant, home, and vehicles; health, including first aid hints from the medical department; and company benefits such as insurance, counseling, etc.

4. **Carry out** company campaigns, contests, etc.

5. **Promote product** sales to employees and their families.

Program is prepared at Borden's New York headquarters as a supplement to local level programs. A booklet entitled "Care and Feeding of Bulletin Boards" sent out to all plants and offices helps improve their value and appearance.

Each month, a series of "Photo Flash" items (posters featuring photographs of general interest), are sent throughout the company. Together with a series of "News Flash" items, brief announcements covering all sections of the company, this material provides information not normally available to local operations.

Program also provides a series of cartoon features to stress safety, value of firm's benefit program, etc. A regular feature is "Molly Moo," a cartoon devoted to office workers. While presented humorously, its messages of improved efficiency, punctuality, courtesy, etc., are always to the point.

Beresky cites the tremendous growth of the Bulletin Board Service as evidence of its worth. Presently, material is bulletined each month to some 36,000 employees in over 1,100 different locations. The booklet describing the operation has been made available to any interested company and Borden has answered several hundred requests for copies.

An Art of Management?

E. R. Niehaus, employee relations boss at Great Western Sugar Co., Denver, explains his company's communications objective as "seeing to it that all of our employees understand the reasons why the company takes the action it does with respect to its employees."

While no formal communications program is used to accomplish this purpose, Great Western treats the subject more "as a separate skill in the art of general management somewhat like welding is to pipefitting."

Firm is fortunate in that all of its factories are located in small

cities or towns. Year around crew is small enough so that management people not only get to know each of the employees working with them, but they are also intimately associated with them in their daily living. Consequently, most of the communicating is done in the day-to-day contact between employee and supervisor.

Says Niehaus: "If the management representative is well informed and in sympathy with company objectives, the employees quickly come to know the company's point of view and be well informed about it."

This communications technique is particularly well-suited to the smaller company which cannot afford an elaborate and expensive program of information.

Of course, Great Western does not ignore conventional techniques of communicating. "We use every method except TV, radio, and newspaper ads to set forth company policy and objectives," reports Niehaus. Main stay is "The Sugar Press," an expertly-prepared magazine published 8-12 times per year. Emphasis runs the gamut from efficiency to personality, and from methods to sales.

"Our primary goal with this publication," says the labor relations chief, "is to get it accepted in our employees' homes to provide them with a general understanding of basic management principles by illustration and by precept."

Denver-based firm seldom makes use of bulletin boards except for announcements of local interest. If a subject is of sufficient interest to give it company-wide circulation of a type similar to that placed on bulletin boards, it is sent out via letter.

In the area of communicating management's position with respect to collective bargaining negotiations, GW has tried every device known—from letters setting forth company position and arguments to supervisory meetings followed by general meetings at the local level to assure understanding. Most recent technique, reported by Niehaus, is to build a resume of the entire position taken by the company at the bargaining table. Material is distributed at a meeting in which the

Charting the Media of Communication

MEDIUM	STRENGTHS	WEAKNESSES	REMARKS
Attitude Survey	Gets ideas up. Potential morale builder.	Findings may be equivocal. May boomerang if not followed up.	Of considerable value in many situations.
Grapevine	Personal. Of, by, and for employees.	Often inaccurate. Does not reach everyone.	Thrives when other channels of information are closed.
Interview	"Natural." Two-way. Personal. Potential morale builder.	Hard to train people to be good interviewers.	A basic medium. Can be used in almost any situation for dealing with all kinds of employer-employee relations.
Public Address System	Fast. Enables management to reach all workers at one time.	Impersonal. One-way. Suitable for short messages only.	Helpful in some matters. Not a basic medium.
Telephone	Convenient. Two-way. Fast.	Not face-to-face.	Indispensable.
Meeting	Face-to-face. Potential morale builder. Faster than talking individually to employees.	Often one-way. Hard to train people to lead meetings well. Unless done well, audience may regard as waste of time.	Basic and universally used. Can go over big or can flop. The important thing is to learn how to run a meeting.
Open House	Potential morale builder. Increases information about company.	Gives only superficial view of company's operation.	While arranged especially for employees' families and for residents of the community, this medium can also promote intracompany communication.
Suggestion System	Gets ideas and gripes up. Voluntary.	Majority of ideas are rejected. Rather slow. Generally used only by minority of employees.	If other media are lacking, a suggestion system may be used by the employees to get gripes, as well as ideas, to management's attention.
Union Activities	Activities often personal. Many deal with matters that are fundamental to employees.	Leadership may not be local. Activities seldom reach all workers.	Value in terms of communication depends on strength of union, leadership, relations with management, and ability to keep close to membership.
Bulletin Board	Official. Convenient.	Impersonal. Only one-way. Suitable for certain types of communications only.	Real but limited function to perform. Nearly all companies use them.
Employee Booklet	Official. Convenient. Comprehensive. Wide coverage.	Impersonal. Only one-way. Needs to be revised rather frequently.	A chief medium for telling employees (new ones especially) about the company.
House Organ	Wide coverage. Report current happenings.	Mostly one-way. Contents often trivial.	General feeling: not the effective communicator it could be.

Source: National Industrial Conference Board survey based on company experience.

company's position is explained and employees' questions are answered.

The veteran industrial relations chief makes one solid point often forgotten by many of today's communicators—confusing education with communications.

"For example," he explains, "we seek to have people understand how our economic system operates and use that as a basis for a communication program in explaining automation, wages, and productivity. But the fact is that the basic understanding and knowledge which an employee must have about these fundamental factors can only be achieved through an educational program and have nothing to do with communications."

Niehaus has learned that two key factors—interest and motivation—provide the most effective communication. "Communications," he points out, "is designed to tell the employee what the company is going to do, when it's going to do it, why it's going to do it, and how what it does will affect him. All the philosophy, economics, politics, and everything else is ineffectual if you can gear the message so that it tells the employee what the whole deal means to him personally."

GF Tries It All

Like most companies, large or small, giant General Foods still considers the most important communications technique to be the day-to-day relationship between supervisor and employee. Other methods, including bulletin boards, publications, annual reports, and even closed circuit television, have been used by GF.

And the main objective of all this, according to GF communicators, is to help employees become well-informed, thereby making them more efficient, cooperative, and productive.

Principal corporate-wide medium is the "GF News," a monthly 24-page magazine produced in the corporate public relations department. At the headquarters offices in White Plains, 1,600 employees receive a weekly 4-page newspaper delivered to their desk every Friday afternoon. In outlying divisions, various media are in use. A bi-monthly magazine at one division goes to all of that division's employees, including both sales force and production personnel. Still another division produces a bi-weekly, 4-page newspaper for all local personnel.

Considered an effective medium is the plant or division manager's letter. These are sent to employees at home and are especially valuable for a particular subject when timing is important. They may include a review of division's first quarter or previous year's progress, plus a look into the future.

Posters, manager's letters, bulletins from headquarters on matters of corporate interest, and reprints of advertisements for new products are all candidates for the bulletin board, in wide use at GF.

Election of corporate officers, earnings figures, and other significant news originating in headquarters is communicated immediately to plant managers and division offices by bulletin, teletype, or telegram.

On occasions when new or improved benefits plans are introduced that affect every employee, a series of meetings is held by local personnel departments. At such meetings, films or slides are supplemented by printed material.

Special situations sometimes have called for multi-city telephone hookups, with selected employees gathering in one place in each city to hear the message over loudspeakers. Closed circuit television has even been used on occasion.

Underlying GF's program is the need to present fair and accurate facts concerning changes in operations that can be expected to affect jobs, thereby creating a "climate of understanding." Implicit in this approach is communication of facts to the local press, civic leaders, city officials and others concerned with industry in their community.

Retraining employees for other jobs when it's anticipated that process changes will displace people is rapidly turning into a major communications technique by many food companies. GF believes the effect of this technique on even those employees not affected by the changes will help make it known that the company does everything possible to help employees.

Officials feel that employees basically know that no company or any segment of it can operate indefinitely without profits. If the cost-price-profit story is told to them believably, it will help create a reasonable attitude in case of any potential problem as automation, wages, or productivity.

Checkmate Communications

By planning continuing communication with employees and community leaders, GF "tries to anticipate and head off problems or provide an acceptable solution before a problem becomes acute."

For example, firm's Birds Eye division formerly operated a trawler fleet and fish processing plant in Rockland, Me. Operation was important to the area's economy. When it became apparent that business changes beyond Birds Eye control would require closing the plant, a continuing program of communications aimed at employees, the press, and the community was begun.

First, all supervisors were told of the decision at a meeting. Union officials were advised and then all employees heard an explanation directly from top management. Local and state officials were invited to a meeting and the local newspaper was brought in.

Birds Eye promised to maintain plant, equipment, and trawlers in top condition until a suitable buyer could be found to take over the fish operation. Termination allowances were paid and the company worked closely with state employment agencies and other industries to assist employees in finding work.

As a result, there was little or no resentment among employees or in the community. Local newspaper editorials commented favorably on the way the matter had been handled.

Revamp Your Program?

If you're not sure that your present communications program is doing an effective job, perhaps you had better evaluate it. Campbell Soup Co. did and decided to revamp the whole operation.

First thing the big Camden-based food firm did was to determine a set of objectives. No formalized list of employee communications objectives had ever been compiled.

Prior to revamping, Campbell's communications media consisted

Communicating Today's Key Issues

If you're wondering how to best communicate with employees in regard to serious controversial issues, consider the media used right now by some of the largest U. S. corporations. Following survey, conducted by The National Industrial Communication Panel (University of Bridgeport), lists media preferred by some 52 firms to communicate current key topics:

ISSUE	MEDIA MOST USED	MODERATE USE
Automation	Plant newspaper Plant magazine Community newspaper	Roundtable conference Newsletters Community radio Letters
Strikes and Work Stoppages	Letters Community newspaper Community radio	Newsletters Plant newspaper Bulletin boards Community TV
Union Negotiations	Letters Community newspaper Plant newspaper	Newsletters Roundtable conference Community radio
Union Elections (Representation)	Plant newspaper Newsletters Letters	Bulletin boards Mass meeting Community radio Community newspaper
Price Increases	Community newspaper Letters Newsletters	Plant newspaper Plant magazine
Wage Scales	Plant newspaper Daily bulletin Newsletters	Individual conference Roundtable conference Community radio
Guaranteed Annual Wages	Plant magazine Letters Plant newspaper	Community newspaper Community radio Newsletters
Right-to-Work Laws	Plant newspaper Community newspaper Letters	Plant magazine Newsletters Posters
Cost-of-Living Increases	Plant newspaper Letters Community newspaper	Bulletin boards Community radio Plant magazine
Political Issues	Plant magazine Newsletters Plant newspaper	Roundtable conference Posters Mass meeting

of: "Campbell People," a monthly publication distributed to all U. S. employees; "Management Digest," a monthly, small-format magazine directed to upper and middle-management which dealt with techniques of management; and bulletin boards consisting of plant or press-relations-originated information distributed from the general offices.

According to Dan H. Dolack, Campbell's Manager - Employee Communications, five specific problem areas were given close scrutiny. Here's what they were and how they were resolved as related by Campbell's communications chief:

► **Timeliness:** Dissemination of news was slow. For instance, the time lapse between the time a baby was born to a California plant employee and the time the birth was recorded in the magazine could be as great as 2½ months. Material had to be written and edited at the plant location; mailed to the Camden general offices; edited; set in type, cleared, printed and bound in Camden; and then shipped to California by surface transportation.

Solution: A newsletter program was established at every plant where there was an "associate editor"—used previously as a correspondent for "Campbell People." Program was expanded until every major plant in the U. S. as well as several in Canada, plus the British and Australian subsidiaries, began publishing newsletters.

Containing material formerly included as a plant insert in the general magazine, newsletters are published at least twice a month. This means that a news event can be reported to employees in less than two weeks after it has occurred—while still of interest. It also means that plant managers have a media with a high readership in which to inject material for local plant consumption.

► **Quality of "Campbell People."** While appearance of the employee magazine was generally acceptable, it was not, in the opinion of the evaluators, acceptable to what was desired for a major concern like Campbell. Problem was to revise the format and improve its editorial standards without losing coverage or readership.

Solution: First change was in frequency—from a monthly to a bi-monthly publication. Economies realized allowed use of four-color photos on several pages.

Editor was able to devote additional time to developing more readable articles in which the company hoped to get its ideas over to employees. Four editions have been published to date and an FE comparison with previous issues noted considerable improvement in this respect.

► **Readership of "Management Digest."** Publication had become more or less stereotyped over a period of several years. A standard cover had been in use and it was felt that various changes were necessary to improve readership.

Solution: Initially, the editorial policies of the "Digest" were changed. Audience is now limited to upper-level management and a new format features photographs on the front cover. Further revisions have been recommended which will convert the Digest into a management newsletter format, published monthly, with special issues as needed.

► **Maximum use of bulletin boards.** Boards were doing an adequate job but were not being utilized fully as a means of constant communication, nor were they carrying material designed to encourage readership.

Solution: Material for the bulletin boards and plant newsletters was supplemented and improved throughout the company by the initiation of a Plant News Service.

This Service provides a constant supply of copy and visual material originating at the general offices. Material, of a general nature, assists local editors in rounding out editorial balance of their plant newsletters and provides information not readily obtainable at their own level.

► **Communications Handbook.** Probably the most important problem was that of providing guidance to management and communications personnel at plant locations. Local "associate editors," usually untrained in journalism, and handling other personal functions as well, had little to guide them. It was evident that a guidance handbook was needed.

Solution: The new handbook for associate editors was developed soon after communications objectives were decided. Included were the new objectives; a description of the media used in the formal communications program; policy material to guide the associate editor in establishing editorial content and format of newsletters; information on the organization of the employee communications function at general offices and plant level; information on style, photography, bulletin boards, interviewing techniques, production, etc.; and a bibliography enabling editors to build a library of authoritative communications.

Campbell communications people do not point to any specific media as being most effective. Each media, states Dolack, has its own particular characteristic and circumstances involved to affect the media selected. "In one situation," says the Campbell communicator, "the best vehicle may be the general magazine. In another situation, the newsletter may be most effective. Each contributes to the program and the program operates as an integrated whole." He warns that the loss of any media "affects the over-all effectiveness of the total program."

Campbell also feels that, in general, major problems cannot be solved solely by a communications program. "The value of good communications," says Dolack, "is that it gives employees an understanding of the reasons behind various problems."

"Do We Know It Works?"

Best communications program in the world would probably be a waste of company money unless it accomplishes its task. Big problem for many of today's communicators is how best to judge results of their particular program.

Miller Brewing has used readership surveys to measure effectiveness. But industrial relations director Makowski emphasizes that "the real proof of the pudding" is not the degree of readership attained, but whether or not the desired employee attitudes and actions come forth as a result of communication.

At Great Western Sugar, effectiveness is measured "by whether or not the company gets an agreement on its terms or has to modify its program because of lack of employee acceptance and understanding." According to GW's Niehaus, "The test is a signed union agreement. In day-to-day operation, the test is how well does the factory run, what are the maintenance and production costs per man hour, etc. As to specific bulletins, most effective judge of readership may be a waste basket count."

Say General Foods communicators, "Perhaps an indication of the contribution our program has made is reflected in the steady growth in our sales and earnings. Another may be our relative freedom from labor disputes."

As yet, Campbell officials do not feel that enough time has passed to measure the results of the program's change-over. A survey is underway in one of the smaller Eastern plants to determine whether or not the employees generally like the new program better than the old. Initial survey will be conducted by a "voting box" method supplied by Automated Preference Testing Corp. Ultimately, a more comprehensive survey will be conducted.

And the Future?

Certain general trends seem to be shaping up in the total picture. Top communicators see these as:

► **More attention to face-to-face communications** reinforced with written media. (Oral communications can readily serve as the heart of the smaller firm's program and as a vital adjunct to the large corporation's effort.)

► **More outspoken managements** through company publications concerning politics, economics, etc.

► **More recognition** at the university level of the need for study in all areas of communications—employee, management, stockholder, etc.

Areas of concern shaping up include:

► **Increasing attention** to new administration's policies expressed in employee-management communications.

► **Problem of selling** the communications budget to top management.

► **Need for a simple understanding** of basic research to check communications effectiveness.

Miller's Makowski sees communications' future as becoming increasingly important in light of new problems, new techniques, and changing management-labor relations. Says he: "The ever-rising educational level of employees and their ability to analyze and judge independently demands an aggressive, complete, and impartial presentation of information."

Great Western's Niehaus sees the future as beset with problems. Variable factors noted are "whether we have new techniques or continue to use the old techniques; whether the unions get more militant or less militant. As long as there is a system wherein one individual is put in a position of authority and is held responsible and accountable for his actions over those whom he has authority, there will be communication problems."

General Foods communications execs predict no basic change in the need for employee communications. They see the current media being supplemented with new techniques but view the increasing need for cost control in industry as bringing about changes in the forms of some of these media.

Campbell's Dolack sums up the role of communications in today's industry and its prospects for tomorrow in concise terms. "Lack of effective communications programs," he points out, "especially in large companies, fosters lack of understanding between management and employees. This, in turn, leaves the door open for dwindling cooperation and less-than-effective support of the company's policies and objectives."

(End)

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Really tough jobs which until now could not be handled in continuous systems are easy—like the precooling, seeding, crystallization and dispersion of honey at a temperature below 60°F. and the freezing of ice cream and ice milk to 17°F. Yes, very high viscosities can be processed now. Remember, if it can be pumped, it can usually be processed with better results in VOTATOR processing equipment.

New concepts in VOTATOR designs offer greater advantages to food processors. Increased thruputs are now obtained when processing viscous materials and high solids slurries. Higher production per unit means valuable building space savings. In the new VOTATOR equipment lower power input makes more efficient use of heating or cooling mediums. Jobs like the cooling and homogenizing of peanut butter, the chilling and extrusion of gelatin and the cooking and cooling of starch paste for salad dressings are done better at less cost in VOTATOR continuous processing equipment.

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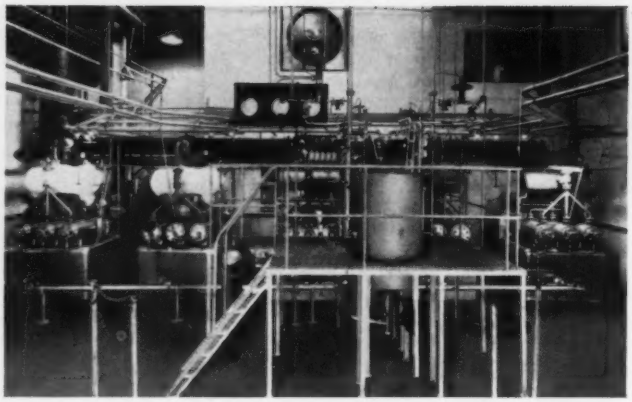
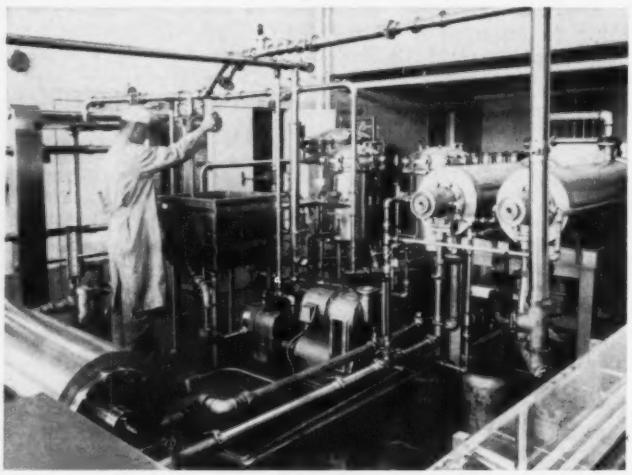
Rugged, dependable VOTATOR equipment is fabricated by skilled craftsmen in strict compliance with ASME codes. A continuous research and development program to assure you of the most up-to-date equipment design for your requirements is in operation.



Continuous slush freezing of citrus concentrate with VOTATOR Equipment at Minute Maid, Plymouth, Florida.



Continuous crystallization of honey with VOTATOR Equipment at Manitoba Cooperative Honey Producers Ltd., Manitoba, Canada.

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Marketing Signals

Not so impulsive . . .

A taste for success . . .

Groves of Academé

How Effective is P-O-P?

Food makers feel point-of-purchase displays are more effective for short-term results, less so for the long haul. That's the implication of a report by Calpak's Ross B. Yerby, Jr., marketing veep, at GMA's mid-year meeting.

A survey of 37 promotions by GMA members found 48.5% reporting "excellent" immediate sales gains vs. only 19% for "excellent" long-term benefits. Noting that industry spends $500-million a year on point-of-sale, Yerby suggests that the findings "are cause for reflection."

Special Handling for Frozens

Dole Corp. joins the growing list of multiproduct outfits giving frozen foods a special box in organization charts. Feeling that frozens have their own distribution and promotion problems, West Coast firm recently created a new post of manager-frozen food sales services.

The manager, working under the marketing director's wing, will be helped by a small field staff. He will devote full time to the frozens, and coordinate his plans with the company's line sales organization, distribution and advertising departments, and brokers.

Familiarity Breeds . . . Sales

So-called "impulse" purchase may not be so spontaneous, after all. That's one implication of a *Life* survey of 1500 supermarket shoppers.

Asked why they bought unplanned items, 36% said it was because the product was "displayed near items they planned to buy," 29% because "it was on sale." **Only 2% traced the purchase to "attractive packaging,"** and 3% to the fact it was a "new item or one never used before."

Preparing for the Future

Though riding the crest of a record pack, Florida's concentrators are busy plotting tomorrow's market. Dr. W. E. Black, director of the Florida Citrus Commission's economic and marketing research, reveals that broad-scale probes have been staked out in the following areas:

1) Demand—with special emphasis on price consumption responses of consumers for each type of citrus product, as well as competition between citrus and non-citrus products.

2) Market development—including future market outlook, plus analysis of advertising programs, market potentials for new and improved items, and measurement of consumer and trade preferences.

Hidden Traps of Price Wars

Besides the obvious loss of profits, price wars hurt in other ways, too. So declared A. G. Mathias, USDA agricultural economist, at recent district conference of MIF and IAICM.

"One less tangible, but very real, cost," he observes, "is the uncertainty that follows, making it difficult to plan operations effectively." Demand for regulations get more attention when price wars are prevalent, he adds. And complaints to the FTC and Justice Dept. mount up, he says.

Diversity Pays Off

Long before Coca-Cola and Pepsi-Cola began to broaden product lines, Canada Dry hitched its marketing to "A flavor for every taste" theme. Sales of the flavors have more than doubled in 5 yrs., company reports, now account for 26% of firm's carbonated beverage volume.

More recently, company began setting up facilities for packing canned beverages. Tinned pop now siphons off 7% of CD's sales.

Marketing Milestone

Nation's first Academy of Food Marketing will be launched next year by St. Joseph's College, Philadelphia. As contrasted with Michigan State's distribution course, new program will provide broad-scale executive training, enabling graduates to serve in either the manufacturing or distributing phases.

College also hopes to set up a food industry research center as part of the marketing academy. Food Fair Pres. Myer B. Marcus, who will serve as chairman of the board of governors, said the industry must now allocate part of its R&D dollars to "the most important product of all—the broad-gaged executive."

BRIEFS

Sales of food stores in '60 reached $54,035-million, Census Bureau reports. Western outlets topped previous year's level by 9%, as compared to national gain of 5%.

Sparked by rising competition, Canada Dry will spend $9.7-million on advertising and sales promotion this year vs. $8.5-million last year.

Frozen foods now account for one-third of its sales, Chun King discloses.

HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

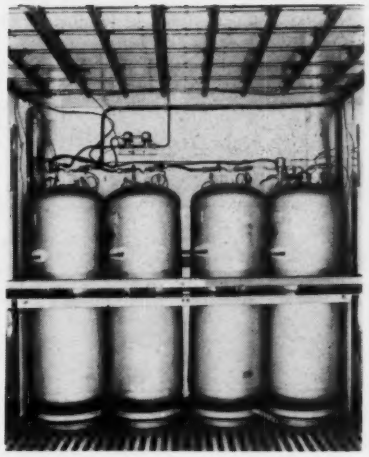
HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department
HERCULES POWDER COMPANY
INCORPORATED
Hercules Tower, 910 Market Street, Wilmington 99, Delaware

PIGGYBACK TRAILER-CONTAINER debuted by REA needs no precooling since desired in-transit temperatures are reached in less than 5 min. Unit is making overnight meat shipments from Omaha to Chicago.



NERVE CENTER of trailer-container includes four 370-lb. capacity nitrogen cylinders shown with partition removed.

Liquid Nitrogen Boomed as In-Transit Refrigerant

Success of local delivery truck units sparks debut of automatic system for nitrogen cooling of long distance piggyback trailers

JUDGING by recent events, liquid nitrogen will soon be used extensively as a refrigerant for the transportation of frozen and perishable foods.

It's the heart of a system which can maintain any pre-selected, in-transit temperature from ambient to —320F. and is becoming competitive in cost with mechanical refrigeration. Because of these and other important plus factors, liquid nitrogen is attracting more and more attention from carriers and shippers.

Howell Trucking Co., N. Y. C., has been experimenting with liquid nitrogen in a number of multi-stop, local delivery trucks. The carrier definitely states that the system is a success judging from test runs to date.

Two other trucking firms are planning to revamp part or all of their fleet into liquid nitrogen cooling after gratifying response from initial runs.

REA Leasing Corp. is installing the system in all-purpose refrigerated semi-trailers and demountable containers for a nationwide network of long-distance coordinated piggyback and highway hauls. And a nitrogen-refrigerated railroad car is past the experimental stage.

Several firms are presently involved in developing liquid nitrogen refrigeration systems. Now in the limelight is the Polarstream process from Linde Corp., the gas-producing subsidiary of Union Carbide Corp. Here are performance factors cited by Linde:

► **Less precooling time.** Truck temperature can be brought to 0F. in less than 5 min.

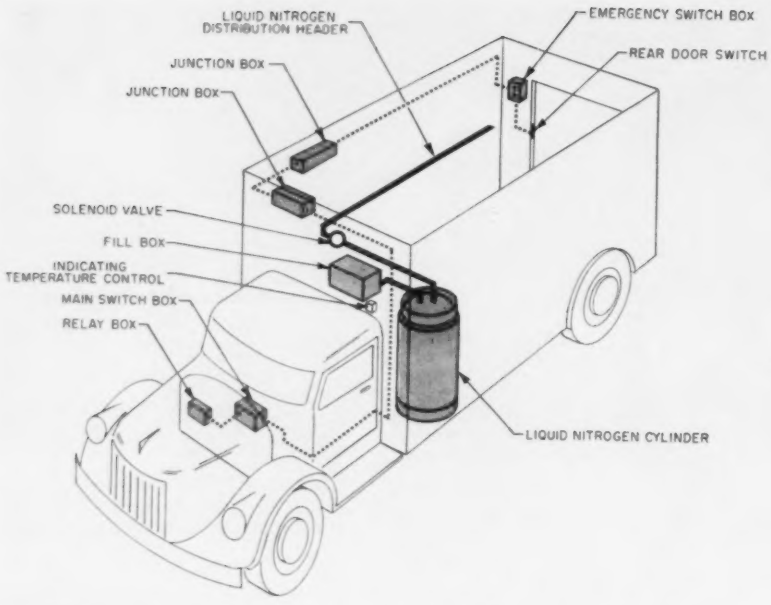
► **Automatic temperature control.** Pre-selected temperatures to —320 F. can be maintained despite hot weather and frequent door openings.

► **Versatility.** Truck or trailer might be used to carry ice cream at —20F. on one trip and perishables at 55F. on the next, allowing maximum utilization of equipment.

► **Lightweight.** Smaller LS-160 nitrogen refrigeration equipment weighs only 475 lb. when filled with 280 lb. of liquid nitrogen. Larger LS-210 weighs in at 600 lb. with a 370-lb. nitrogen capacity. Both units are relatively lighter.

► **Compact.** Unit occupies little space in van interior, allowing

JACK L. MISCHOU
Assistant Editor, "Food Engineering"



TYPICAL INSTALLATION in multi-stop truck. When temperature rises above desired level, relay sends current through solenoid to open cylinder valve and permit nitrogen to enter distribution header pipe.

maximum payload. Also, there is no need for open space to permit air circulation around cargo.

► **Low maintenance.** Since system involves only one moving part, maintenance costs are very low and technicians or mechanics are not regularly required.

► **Zero code assurance.** System enables frozen food shipper or carrier to attain and hold low-temperatures prescribed by industry or AFDOUS codes.

How It Works

Key to effectiveness is the liquid nitrogen with its temperature of −320F. It is non-toxic and inert. One pound will absorb 85 Btu. when it changes from liquid to gas. Then the cold gas circulating in the compartment will absorb an additional 80 Btu./lb. With a liquid-to-gas expansion ratio of 610:1 at 0F., need for large cargo-free areas to permit cold air flow and efficient heat exchange is eliminated.

Basically, the Polarstream process consists of a liquid nitrogen storage cylinder, temperature controller, relief valve, spray header, and the necessary valves, piping, and safety devices.

The 20-in. storage container fits snugly into a cargo compartment corner. A compact filling control box and temperature-setting device is conveniently located outside the cargo compartment near the cab. Power is taken directly from vehicle's electrical system, easily supplied from existing 6- or 12-v. truck batteries.

Nitrogen, held in cylinder at about 15 psi., is sprayed onto cargo from a single spray pipe attached to van ceiling. Holes in tubing at spaced intervals evenly distribute the refrigerant.

Heart of the control system is an electrical bridge circuit, one leg of which is a thermistor whose resistance varies with its temperature. This sensing element actuates a relay to operate a solenoid valve. Latter controls flow of liquid nitrogen from cylinder to spray pipe. Liquid nitrogen sprayed across the cargo flashes into a cold, dry gas almost instantly.

At each delivery stop, opening of cargo compartment door automatically shuts off the system to avoid wasting nitrogen. At day's end, system is turned off and placed in stand-by condition until the next run. Remaining contents can be left stored in the cylinder for next day's use with less than 1% loss.

System can be installed in one day. Cost of the LS-160, aside from liquid nitrogen consumption, is $600 for the cylinder, $400 for filling and control equipment, and $150 for installation — total of $1,150. Larger LS-210 unit comes installed for only slightly more—$1,220.

A central storage tank for the liquid nitrogen is leased from and serviced by Linde. Prior to dispatching a vehicle loaded with frozen or perishable foods, truck is filled from this central tank, which may range from 1,500- to 175,000-lb. capacity depending on requirements. Truck filling takes less than 5 min. via pressure and manifold can be attached to central tank to fill several containers simultaneously.

Proves Out in Practice

Howell actually began experimenting with liquid nitrogen for local delivery trucks in '58. System's success prompted firm to add more liquid-nitrogen-equipped vehicles to its fleet until it now sports 16 nitrogen-cooled units in operation.

According to Howell's general manager, W. R. Lockwood, the system is a complete success. Firm plans to equip all new trucks with liquid nitrogen—about six each year. Cost of re-insulating present mechanically-refrigerated vehicles deters Howell from revamping its present fleet of 60 pieces.

Though Lockwood feels Polarstream process has several advantages, direct cost comparisons, as far as he can determine, indicate system is still more expensive than mechanical refrigeration to operate. He judges his nitrogen-equipped units to hit a summertime maximum of $9-$10/day as compared to $7/day for the balance of mechanically-refrigerated units. But he emphasizes that an exact gage or measuring device for checking nitrogen usage is still needed to produce a positive dollar figure.

(Linde estimates $1.40/hr. maximum cost for operating a Polarstream truck and estimates a minimum figure of $1.50/hr. for mechanical refrigeration. Estimates are based on at least a 10-truck fleet. Supplier also points to initial capital investment of $1,150 for Polarstream LS-160 as compared to an estimate of $2,000 or more for mechanical.)

Howell believes it is receiving a net savings as well as better efficiency despite the higher cost. According to Lockwood, maintenance costs have been virtually eliminated along with load spoilage costs. He also points to the lower capital investment and potentially higher payloads.

Initial truck cooling time is im-

portant to Howell and again the nitrogen system is most efficient. Lockwood reports that his nitrogen trucks can be brought from 70F. to 0F. in a matter of 3-4 min. compared to the precooling time of mechanical refrigeration which he judges to be one degree/min.

Escro Storage & Cartage Co., Buffalo trucking firm which delivers packinghouse products to most of New York state and parts of Pennsylvania, placed four Polarstream-equipped units on the street in mid-July and is particularly pleased with customer reaction.

Response has been so good that v.-p. J. L. Esposito reports Escro will revamp its whole fleet into liquid nitrogen. Says he: "We're pleased in many ways. System is efficient, simple to operate, and maintenance is much less. What's more, we don't have to worry about a motor failing with this equipment."

He also feels that the system will be cheaper than mechanical refrigeration over the long run. This may be true since the actual cost of liquid nitrogen is the most important factor in economy comparisons. As the cost per pound drops when the rate of consumption increases, the unit cost for a larger fleet with greater requirements could be low enough to make the system economically feasible in all ways. (Linde estimates 10-truck fleet minimum.)

Then, too, truckers are seeking ways to lower amount of nitrogen used. Howell, for instance, has been experimenting with curtains, barriers, and movable inner doors to eliminate unnecessary refrigeration of empty cargo space. This is especially relevent near end of day's run. Another boon to reduce nitrogen waste may be the adoption of better truck insulation materials and techniques.

One unique advantage is pointed out by Philadelphia Dressed Beef Co., which is in the process of revamping several trucks with liquid nitrogen. Firm has been faced with noise problems because of a residential location. As a result, trucks had to be moved several blocks in the morning for pre-cooling operations. With new liquid nitrogen system, problem is ended.

Company is now getting set for a series of test runs in the Philadelphia area and has a central storage tank already in place. Test results will be made available to all interested parties.

Nitrogen on Piggyback

Aside from Howell, Escro, and Philadelphia Dressed Beef, Linde ran its Polarstream local delivery system through USDA testing in Florida early last year. (See Test of Liquid Nitrogen Refrigeration System in Frozen Foods Delivery Truck—AMS-426, USDA.)

But long distance runs remained only in the experimental stage until last month when REA and Linde combined for a successful piggyback operation. First equipment, leased to the Burlington RR, is being used to piggyback fresh meat at a constant 35F. for Armour & Co. and other packers overnight from Omaha to Chicago. Meat then goes through connecting services to Eastern seaboard points.

According to REA and Linde, meat can be refrigerated automatically in the polyurethane foam-insulated 40-ft. container-trailer at 35F. for 80 days without any in-transit attention. Desired in-transit temperatures are attained in less than 5 min.

Same advantages accrue to trailers as to multi-stop trucks. Then, too, trailers and containers are said to be cheaper to build and save more than a ton in gross weight compared to the mechanically refrigerated units of equivalent capacity.

Liquid nitrogen is carried in four LS-210 cylinders, each with 370-lb. capacity, in a 20-in. deep section at trailer's head end. Two 12-volt batteries power the simple thermostat-solenoid system which actuates the nitrogen spray in the same manner as in the local delivery truck.

Mounted in front exterior of trailer is the "fillbox" and control assembly; a control thermostat and set knob, with a preset temperature pointer and cargo temperature indicators; and remote gages indicating the liquid nitrogen level in each of the four series-connected cylinders.

Cost of liquid nitrogen equipment is estimated by Linde at $3,000 compared to an estimate of $5,000 for comparable mechanical refrigeration equipment.

Trailer, demountable from a bogey trailer chassis, is supplied by Railiner, Inc. Semi-trailer equipment is provided by Fruehauf Trailer Co. (End)

No area can be all things to *all* industries. But we've got down-to-earth facts that prove the Toledo-Northwestern Ohio area is right for Food Processing Industries. These facts are reported in a study of the area by Fantus Research, Inc., one of the nation's foremost industrial location services. If you would like to evaluate this information in terms of your plant location plans, write R. E. Johnson, Manager, Industrial Development Department, The Toledo Edison Company, Toledo 1, O.

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GM's Straight Answers

. . . Build distributor loyalty, promote management

TROUBLE-SHOOTING in the sensitive manufacturer-customer area has been given a new wrinkle. Idea now is to snuff out tricky problems before they develop.

A good case in point is General Mills' successful new program which pivots around a trade-customer relations director. In its first year of operation, the new setup has benefited GM three ways — promoted smoother management teamwork, improved relations with distributors, and given company planners better tools to work with by acquainting them with what's on the minds of key buyers.

While more and more food makers are adding a "trade relations director" box to their organization charts, GM progressively goes one step further by including "customer" in the title. That's because, as E. H. Andreson, the new director, puts it, "We look on it as a dual task involving 2-way communications between company and food manufacturers (the trade) and between ourselves and retailers (customers)."

FREQUENT CONTACT with key accounts is credo of General Mills' Director of Trade-Customer Relations E. H. Andreson. When not holding frank give-and-take sessions with distributor execs, he's on the phone explaining new programs.

Why New Post?

Andreson points out that most food manufacturer's communication systems haven't kept pace with trend to fewer and bigger customers. Also he notes, sales managers, increasingly tied down with day-to-day problems, have less opportunity to visit customers.

Most relationships between food manufacturers and distributors, he feels, are largely restricted to that of seller and buyer, making it easier for misconceptions and misunderstandings to develop. As Andreson sees it, major job of the trade-customer relations director is to head off such difficulties before they crop up.

JOHN V. ZIEMBA, Senior Associate Editor, "Food Engineering," Chicago

When General Mills started to break ground for this new program, it wrestled with such knotty problems as: How well was it prepared to communicate? How capable were the director and his associates? What were the pitfalls of saying too much? What can — and can't — be discussed? What was the status of communications within GM's management organization?

From this debate emerged these five laid-down functions for the trade-customer relations director:
1) **Interpret and promote** General Mill's corporate programs, policies, and procedures to top-level decision-makers among distributors and other food manufacturers.
2) **Keep pace** with changing demands and problems relating to distributors and retailers.
3) **Assume responsibility** for direct contacts with top customer executives. Provide a central source for customer inquiries to clarify policy and reconcile differences.
4) **Supplement** (not replace) relations between company's sales force and customer.
5) **Represent customers** in interpreting trade trends while, at the same time, counseling company's sales personnel on best practices.

Choosing Right Man

Obviously, deciding who should occupy this sensitive area is not an easy matter. Especially significant about GM's slotting Andreson in this post is the fact that he's a top corporate official, with a strong say in policy- and decision-making. Furthermore, as a former sales and marketing director, he has a broad first-hand familiarity with customer problems.

There are two ways to select a man for this post. One approach, as followed by GM, works

to Hot Questions . . .

teamwork . . . Result: Less chance of misunderstandings

a top-level officer into the position because he understands corporate policies and procedures, can make fast, sound decisions.

A more common route is to pick an "elder statesman" executive—from sales or marketing, for example—so as to obtain company-wide benefit from his experience and contacts before his actual retirement. This procedure, in GM's view, doesn't build for continuity. **The company sees the post as a valuable separate function that calls for the best available man, and one whom sales organization and the trade alike can look forward to working with over a period of time.**

Andreson devotes considerable time to discussing company plans and operations with his backfield —those on the management team involved with marketing, advertising, selling, distributing, processing, packaging, developing new products, etc. At the same time, he interprets the customer's point of view to GM officials.

This intra-management communication gives Andreson the required information for sound decisions. And it enables him to transmit facts more clearly to customers, thus reducing the chances of misunderstandings.

During the program's first year of operation, Andreson has logged give-and-take discussions with top management of over 100 small-, medium-, and large-size food distributor customers. His objective: Contact customers doing 65% of the company's business within 2-yr. periods. Furthermore, he personally attends over half a dozen conventions a year.

Winning Friends

GM's program is set up to do more than just put out fires. "That," Andreson says, "is the negative approach, because you never have trouble with your friends." If a misunderstanding between sales and a customer crops up, Andreson tries to straighten it out with a direct phone call to the distributor (whom he usually knows by name).

Andreson puts a great stress on frequent personal contacts with customers. That way, he insists, every one will know that General Mills wants to contribute to their mutual success.

Customer meetings (usually lasting 2 hrs.) are set up a month in advance by GM's district managers. The director informs the managers as to the major subjects to be covered, and who should be present.

Andreson then sits down with from three to ten people—usually the customers' president or general manager, head buyer, ad and promotion managers, and manager of warehousing. He invites frank questions relating to sales, merchandising, promotions, packaging, new products, and policies. At the same time he listens to their ideas—maybe on merchandising, promotions, policies, problems, etc.

Most of the problems discussed are directed toward industry practices—like multiple deals involving capital and warehouse-space duplications, non-usable POP material, faulty container labeling. Customer is free to bring up any subject he wants to talk about.

Customer reaction to GM's program strongly indicates that Andreson's wanderlust really pays off. He's building up company's image, improving relations and thereby preventing and minimizing problems. And customers are grateful for the time the company devotes to their problems.

GM has benefited in other ways, too. For example, Andreson often

Four Keys to Better Customer Communication

Part of management's failure to get its story across to food distributors is due to inadequate preparation. Here are 4 tips on preparing the trade and customer relations director and certain key employees for interchange of instruction, information, and ideas:

- **GET INFORMED.** If a trade-customer relations director doesn't know and understand what's going on, he can't communicate. Obviously, it's best if he knows in advance. If a director has to dig up an answer every time he gets a question, his customers will soon turn to some other source of information. The well-prepared director stocks information in reserve, so that he'll know a lot more than the bare minimum he wants his customers to know, as well as see the facts in broad perspective. Unexpected questions will be answered more readily by this reserve of knowledge. His span of knowledge should be far greater than his span of communication.

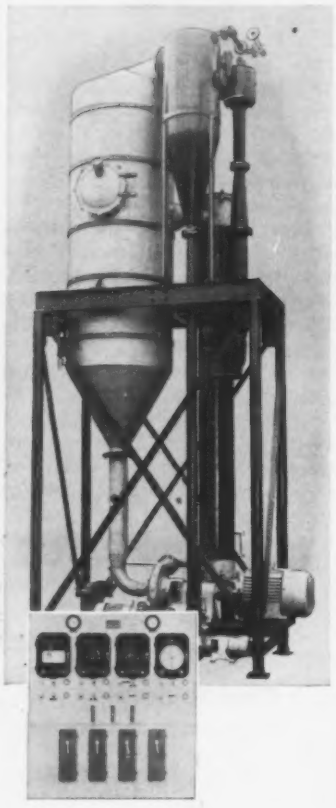
- **DEVELOP A POSITIVE ATTITUDE.** The smart director tries to share information with customers to the extent that they think they need it—not just communicate with them when he's compelled to. He knows he's made progress when his customers are informed, feel informed. This positive attitude works both ways, provided there's positive listening and information-giving at meetings with customers.

- **SET UP A COMMUNICATIONS' PLAN.** Customers like to be told in advance about changes that'll affect them. That's why communication must come at the start of action.

- **GAIN CONFIDENCE.** The meaning a customer gets from a trade-customer relations director depends upon his confidence in the director. Confidence requires good faith. Meaning is more effectively imparted when customer understands a food company's purposes. When the purpose is known, the situation's ripe for understanding. Even if the customer knows why, it doesn't mean he always agrees. While understanding doesn't assure agreement, it does permit both parties to interact freely—and without confusion—so they may seek agreement.

this
PRE-EVAPORATOR

*was custom-engineered to save 1200 boiler horsepower**



* A Pre-Evaporator of the type shown, was custom-engineered and fabricated by THERMOVAC to process 80,000 lbs. of juice per hour — at an hourly savings of 40,000 lbs. of steam, over existing equipment! Automatic remote control panel is 150 feet from the system.

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finds that customer management can be 'way ahead of company's salesmen on ideas and policies—as when GM idea-plucked the group trend toward palletized shipments.

Guides to Success

Based on what has been achieved by GM's program, Andreson has definite ideas on what is needed to make a customer-trade relations director a contributor to company profits. Here are some of the guide-line he relies on:

. . . **Develop programs** using top level GM executives to create the best company image possible. Do it through trade association and pre-planned customer contacts (at high level).

. . . **Plan customer contacts** as well as activities in conventions and trade associations to reach key people.

. . . **Interpret techniques, developments, and requirements** to implement more effective planning and action in marketing, advertising, sales and distribution. Then, where possible, take corrective follow-through action.

. . . **Maintain**—in the atmosphere of building good will—a climate for free flow and exchange of ideas and discussion of problems between company and its customers.

. . . **Keep customers aware** of General Mills' determination to listen to them and to formulate modernized policies for improved relations.

. . . **Act as a clearing house** for company action and for follow-through on recommendations devised by Grocery Mfrs. of America, and work closely with the group's committees.

. . . **Handle** — as requested by sales, marketing, advertising, and personnel departments—direct inquiries to the trade on requests for information pertaining to general trade practices.

. . . **Keep abreast of marketing trends** and progress of existing or new products in order to maintain adequate conversational knowledge (or discussions) with all types of trade factors.

. . . **Participate in discussions** involving package changes, container design, coupon layouts, etc., to be sure they're in conformance with recommended industry practices.

. . . **Counsel with sales and marketing** in areas of product sales promotion, pricing, and delivery methods or distribution.

. . . **Periodically review** all form letters (direct mailings to customers) used by sales, accounting, advertising, and distribution departments.

. . . **Alert operating departments** concerned of trade reactions — good or bad—pertaining to company and its products or personnel.

The above-listed duties are self-performed (by trade-customer relations director). What he delegates are controversial matters (trade contacts or inquiries) to respective internal departments for their consideration and prompt action.

In most instances, replies to customers are handled by the director. Internal department follows through on arrived-at decisions. Director of trade and customer relations then promptly advises customer of such favorable action. (End)

What Distributors Think of Your Trade Relations

The trade-customer relations director "must carry a great deal of authority, even on the policy-making level," if he is to prove his worth. That was the opinion voiced by key retailers and wholesalers contacted by FOOD Engineering.

The vice president of one of the top ten chains put it thusly: "Trade relations are best carried out when the entire organization, including top management and the sales force, are deeply concerned about their trade practices. In most cases, appointing an individual 'to be in charge' of this type of contact is not a satisfactory arrangement unless he carries a great deal of authority. Too often, his appointment has been one of an errand boy go-between. That does not produce connecting, satisfactory communications."

The president of a leading Eastern wholesale grocer outfit hailed the educational programs of General Foods and Pet Milk "for being instrumental in opening up opportunities for my personnel to receive special training in such management areas as communications, motivation, job evaluation, interviewing, work delegation, etc. This has nothing to do with price of coffee or evaporated milk, but it certainly has a great deal to do with helping us develop expert managers."

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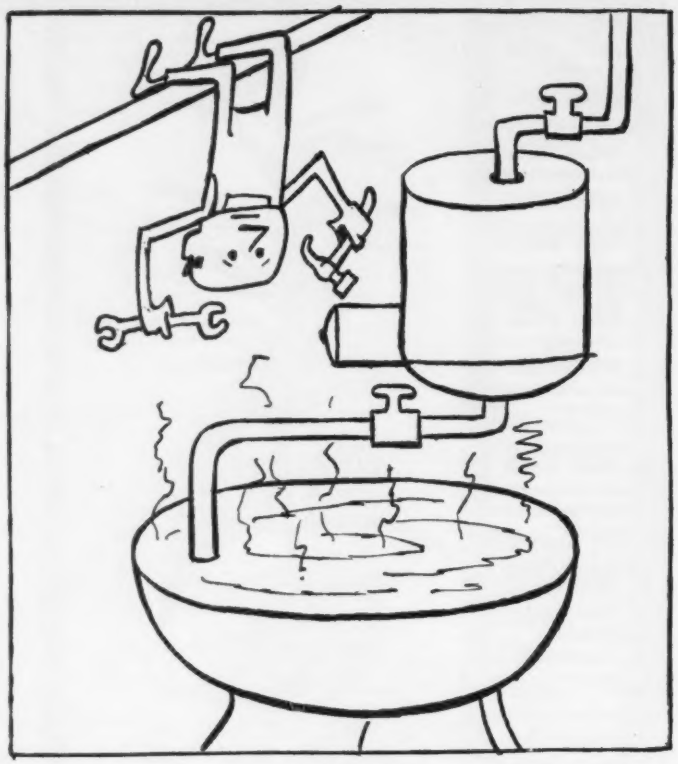
AND SEASONINGS

SPEAKS FROM EXPERIENCE —

Joe Urschel has designed food equipment for many years. Parts of cutting machines made by Urschel Laboratories are built to tolerances more precise than those for many parts of a good watch. Mr. Urschel knows from experience what flagrant abuse by processors can do to equipment.—The Editors.



ENGINEERS ignore ease of maintenance when they place equipment.

Food Processor's Responsibility

CERTAIN ATTITUDES of management of food processing plants tend to discourage the design of better food processing machinery. Specific experiences of Urschel Laboratories, Inc., who have designed food cutting machinery for more than fifty years, demonstrate this situation. These experiences, however, relate in many ways to all types of food processing machinery.

One major change which has taken place in the design of machinery is to build it to run at higher speeds. This is to meet the demands for higher production and lower costs. Machines are available to slice pickles, carrots and other vegetables one slice at a time, but at a rate of 500 slices/sec.

A new machine is being marketed with the cutting parts clearing each other by only five thousandths of an inch at speeds of 170 m.p.h.

Several parts of various cutting machines are made to tolerances of less than one ten-thousandth of an inch. Many parts of a good watch are not held to this precision.

The same food processors who insist that highly trained personnel check the qualities of their products will employ, without careful investigation, any man who claims to be a mechanic. Then they will direct him to care for precision machines without either training or instruction. The mechanic, in not knowing what is required for good maintenance, often will permit the equipment to degenerate to the point where costly repairs are necessary and where loss and damage occur to the food product.

In many instances, instruction books for the machines never get by the purchasing department, where they are filed away.

Accessibility Ignored

To further aggravate the maintenance situation, engineers who lay out the lines often seem to be concerned only with product flow through the plant. They completely ignore adequate placement of equipment for ease of maintenance. Sometimes vital parts of machines cannot even be inspected because the machines have been placed against a wall or against other pieces of equipment. At other times, machines are elevated high above the floor with no place for a mechanic to stand while he works on a machine.

To fix certain machines, mechanics sometimes must stand in pools of water or fight a cloud of steam. Often the layout engineer reasons that since machines have

JOE URSCHEL, President,
Urschel Laboratories, Valparaiso, Ind.

Exaggeration ? ? ?

"The management of many food plants may think that what is written here is an exaggeration of facts.

"Actually, we could tell you of many instances of greater flagrancies in processing. To print these would not show good taste."—J. U.

AMOUNT of foreign material in raw product is increasing.

Toward Better Machine Design

no eyes and cannot see, no illumination need be placed over the machinery. In these instances, two maintenance men are required, one to work and the other to hold a flashlight.

Lubrication Is Careless

The larger food plants employ people whose jobs are to lubricate machines. They usually are untrained men who go about with grease guns that have handles about two feet long. One jolly heave-ho on one of these handles will exert several hundred pounds pressure per square inch within the bearing housing. This quickly blows out all of the carefully placed grease seals employed to protect the bearing against damage by water and other substances.

All food plants close down at various intervals to completely clean the equipment. During the shut-down, a crew goes into the plant with high-pressure steam hoses to clean the machines. Sometimes they shoot steam into the electric motors through the bearings, removing any grease that may be left on gear surfaces or other wearing parts.

Cleaning or Wrecking Crew?

To clean the machines, they remove all guards, hoppers and chutes. These often are not laid carefully onto the floor, but are thrown across the plant. This eventually causes complete destruction of these parts. Loose nuts and bolts may be left inside the machines to wreck them when they are started again.

The men often are the lowest paid people in the plant, and yet the food processor's entire investment in equipment is at their disposal.

Some management people appear to sympathize with the destructiveness of these clean-up men. These executives say that, after all, the men have a very nasty job and therefore cannot be too much at fault in their recklessness.

Quick Death for Knives

Over the years it was discovered that, although processors purchase machines to cut their food products into small pieces, many of them did not hire anyone capable of sharpening the knives. It was for this reason that the Urschel Potato Chip Slicer was marketed with throw-away knives which could be purchased for a fraction of the cost of sharpening knives.

This venture was not completely successful because the majority of potato chip processors run large rocks into the slicers along with the potatoes. This causes the parts which hold the knives to

be bent beyond any further usefulness.

Rock-removing apparatus can be purchased for a few hundred dollars, but many processors seemingly prefer to spend thousands of dollars for machine repairs rather than install this apparatus.

Only recently, one of our engineers visited one of the larger pickle processing plants to investigate a complaint that one of our relish dicing machines produced only a small fraction of its rated capacity. After discovering that the knives were broken, the engineer inspected the pickle stock to be processed by the dicer. In one small sample of pickles was found a selection of pieces of wood, wire, bolts and nuts, nails, dowel pins and chunks of glass.

The amount of foreign material mixed in with the raw product is increasing because of mechanical harvesting of fruits and vegetables. In addition to this, food products brought into a plant often carry some foreign materials picked up in handling, storage or transportation.

A very few processors use inspectors ahead of cutting machines, but these people become fatigued and permit much foreign material to go by unnoticed. Devices are available, or can be easily worked out, to remove all junk from the food product without the use of labor. Only a small minority of processors use them, however.

There has been much talk in recent years of the importance of communications within a company. For this reason, it is surprising to find a complete breakdown of communications on maintenance procedures between several plants owned by one company. The type and extent of maintenance in each plant is left to the discretion of the management of the individual plant, with each plant not knowing what the other is doing.

All of the adverse procedures thus far outlined increase costs and reflect unfavorably in the finished food product.

What To Do About It

It is a sad commentary on twentieth century achievement when some large, prosperous processors select the finest raw material, use the best means of sanitation, process the product under carefully controlled conditions and yet completely depreciate the tools with which they achieve this.

The prerogative to improve these conditions rests entirely with management. These precautions are suggested:

► **Management should instruct their engineers** to devote some effort toward the placement of equipment so that it could be worked upon with ease.

► **Management should instruct their personnel departments** to carefully select mechanics and to put them through a training program on the care of specialized precision machinery.

► **People who clean machines** should be carefully selected and trained.

► **These cleaning jobs should be upgraded** in pay to correspond with the responsibility involved.

► **The status of these people** should also be raised from the category of "flunky" to some title reflecting the skills required.

► **Someone in the mechanical department should be given the authority** to shut down operations when equipment is not in proper operating condition.

In contrast to such precautions, consider the attitude of a production manager in charge of several food plants. He has told us that, with the types of people whom he must employ, he must have machinery which requires no maintenance at all. This attitude creates an impossible goal for the machine designer.

No knife has been made which will stay sharp forever. No knife can be made to cut food products and steel bolts with equal effectiveness. All bearings, gears, cams and other wearing parts have a limited life, and no precision parts can long withstand the impact of hammers wielded by morons.

Designers Handicapped

The number of good design engineers for food processing machinery is limited. Therefore, the total number of hours of design work available to the industry also is limited. Only a small portion of this time can be devoted to parts of the machine with respect to the processing of the food. Most of the designer's time must be devoted to devising ways to combat the tendency of plant employees to destroy the equipment.

There are many designs of efficient machines that could be given to food processors now, except that this would be like setting chinaware into a pen full of bulls.

The field of electronics has come of age and can be usefully designed into certain devices. However, electronic equipment is not infallible, and relatively few processors employ people with the required knowledge and skills to keep it working.

It is for this reason that many new and wonderful methods and techniques can only be delegated to the dreams of a world that might have been.

Will Do Best—But

The machine designer will, of course, do what he can to design machines that can be used in today's industry. Throw-away knives will be used where it is practical to use them. More parts will be made of hardened and tempered stainless steel. Bearings will be prelubricated and placed in disposable cartridges. Modular designs will be made in which entire sections of a machine can be quickly replaced and the old sections thrown away.

The throw-away sections would be made inexpensively, but would all be built of hardened parts to have a relatively long life. Such designs are being considered for seasonal industries which very seldom employ skilled mechanics.

It will be necessary to make all parts of machines that are removed by clean-up crews of extremely heavy construction. Designs with complicated mechanisms must be discarded even though they would tend to lower the cost of a food product or improve its quality.

No Exaggeration

The management of many food plants may think that what is written here is an exaggeration of facts. Actually we could tell you of many instances of greater flagrancies in processing. To print these would not show good taste.

There are food factories where excellent maintenance is achieved from an intelligent and scientific approach. These rare exceptions are found at random in both large and small industries. Some of the best operations can be found in a few small plants where the value of overall efficiency is visually obvious to top management.

The quality and usefulness of the food processing machinery of tomorrow will be considerably related to the attitude of the management of the plants which use this machinery. (End)

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Sterling's variable speed drive never requires lubrication

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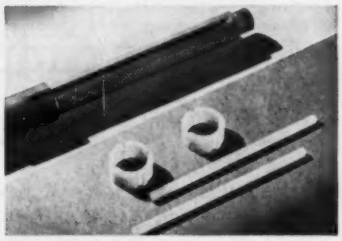
Sealed and shielded bearings require no lubrication.
Keys are fabricated from tough elastic material to eliminate key and keyway wear.
Wear-resistant non-metallic bushings require no lubrication.
Shaft surfaces are corrosion-proof and require no lubrication.

All lubrication maintenance problems are eliminated by Sterling's new variable speed drive. Fret corrosion is completely eliminated. Sticky pulleys, resulting from improper lubrication, are no longer a problem. Belt life is lengthened; pulley wear is eliminated.

Special load-bearing surfaces never require any attention or lubrication. Keys and bushings will not wear out. Shaft surfaces are also tough and wear resistant.

Sterling's new "Lube-Free" variable speed drive can be installed in any location, no matter how inaccessible, since lubrication maintenance is no longer needed.

Complete application and product information is available by writing Dept. S-8, Sterling Electric Motors, Inc., 5401 Telegraph Road, Los Angeles 22, California—or by contacting the Sterling field engineer in your area.



Tough shaft surfaces provide unusual chemical resistance and anti-frictional properties. Specially fabricated keys and bushings hold up indefinitely.

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Celite Division filter aids, when used as such, are not considered food additives as defined by FD&C Act Amended, Section 201(s).

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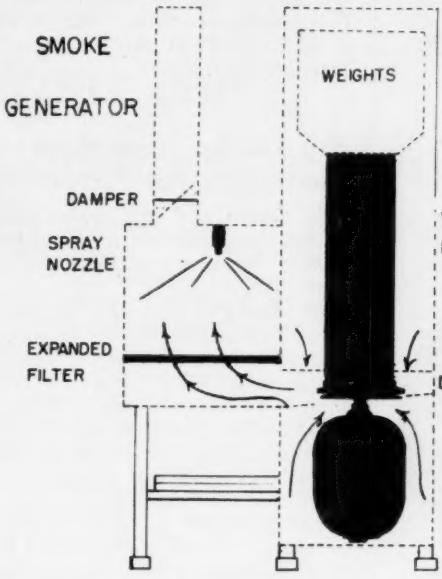

DISC, driven by a 5-h.p. motor, spins against end grain of wooden block to produce smoke which is passed through a metal screen and washed with water from a spray nozzle. Smoke volume is regulated by weights added to the top of block.

Friction Smoke Generator Provides a Quality, Controllable Wood Smoke

While air conditioned smokehouses provide accurate control over temperature and humidity, some density and characteristics are not closely controlled in most cases. Accurate measuring techniques for smoke density and rapidly responsive smoke generators until recently have not been available.

The friction-type generator, now commercially available, was designed to provide a more controllable source of wood smoke. This study reports some of the performance characteristics of a friction generator and the taste panel comparisons of frankfurters smoked from a friction generator and from the burning of dampened hardwood sawdust.

The friction smoke generator (from L. C. Spiehs Co., Chicago) produces smoke through action of a spinning disc against the end grain of a wooden block about 6 in. square. The smoke is passed through an expanded metal screen and washed with water from a spray nozzle located above the filter in the smoke duct. It was found that the manner in which the smoke was filtered and washed had a distinct effect on product flavor.

Basic flavor and odor differences exist between products processed with smoke from friction generators and from burning sawdust. Some taste panel members preferred frankfurters smoked with the friction generator, while others preferred the conventionally smoked products. This might suggest that if consumers could make a direct comparison, certain markets or areas might have a preference for one type. This also indicates the necessity for finding ways by which the characteristics of friction-generated smoke can be changed to meet specific needs.—*American Meat Inst. Foundation,* Bul. 47, Mar. 1961.

Costly Stack Burn May Be Controlled

Stack burn is a form of deterioration occurring occasionally in all types of processed foods. When stack burn occurs, foods must be sold at reduced prices or discarded.

Chemical reactions accounting for stack burn are: 1) Browning reactions—sugar, amino acids; caramelization; oxidative, enzyme catalyzed and nonenzymatic; and, 2) Natural pigment reactions—involving chlorophyll and the anthocyanins.

Knowing the causes, stack burn can be controlled. Beginning with raw material, storage practices leading to stack burn must be avoided. Careful preprocessing procedures, such as adequate blanching, exclusion of air, and deaeration minimize both enzyme catalyzed and nonenzymatic oxidative reactions.

Additives such as sulfur dioxide retard sugar-amino acid reactions, while ascorbic acid retards oxidative reactions. Unduly high processing temperatures and prolonged heating will increase the possibility of stack burn.

Proper water cooling after sterilization followed by efficient air cooling will minimize storage changes. Since prolonged storage at normal temperature also results in stack burn, low temperature storage is desirable.—*Farm Research,* 4-5, Sept. 1960.

High-Temp. Drying Impairs Wheat Baking Quality

High artificial drying temperatures may impair the baking quality of wheat without affecting external appearance of the grain. Research indicates high-moisture wheat is damaged for baking at lower drying temperatures than wheat with low moisture.

If the wheat contains too much moisture for safe storage, it is sometimes dried by heated air at the elevators. Wheat to be saved for seed is more susceptible to damage by high drying temperatures. Depending on the grain's moisture content and the time required for drying, temperatures above 110F. are likely to impair wheat germination.

In wheat of 27% moisture, intended for bread-making, bread loaf volume may be damaged at drying temperatures above 160F. For 19.4%-moisture grain, 180F. is about the maximum drying temperature that can be used without impairing bread volume. At 16.5% moisture, drying temperature

FOOD WRAPPERS of *Non-Toxic—Pure White—vegetable parchment*

DESIGNED to make your brand attractive and outstanding

AND PRINTED with colors that make your product appetite appealing

We have the facilities to make your moist-food wrapper.
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Lard Carton Liners
Liners for Meat Tins
Loin Paper
Margarine Wrappers
Meat Wrappers
Milk Can Gaskets
Multi-Wall Bag Liners
Parchment Circles
Parchment Duplicating Masters
Parchmentized Kraft
Poultry Box Liners
Poultry Wrappers
Release Parchment
Sausage Wrappers
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Special Parchments for Frozen Foods
Tamale Wrappers
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should not exceed 188F.

Bread quality was satisfactory in loaves baked from 27% and 19.4%-moisture wheat dried at up to 160F. Bread quality, but not loaf volume, was satisfactory when 16.5%-moisture wheat was dried at up to 200F.—*U.S.D.A.*, Report, June 14, 1961.

Dry Process, Low Heat Continuous Fat Extraction

A simple and continuous dry process for rendering fat has been evolved by Sharples Centrifuges, Ltd., England.

By operating at a low temperature and avoiding the use of water for extraction, a fat of good color is produced which has a low free fatty acid content, and low peroxide value. Further the protein removed in the process is not degraded. Production capacity of 8,000 lb./hr. is possible.

Fat produced at such low temperatures (65-70C.) and with very short processing time (clarified at 95C.) has high standards of purity and good keeping qualities. Typical analyses of such fats is shown below.

	Pork Fat	Oleo Stock
F.F.A.	0.1-0.15%	0.25%
Moisture	0.1%	0.1%
Color	0.4 red	1.5 red
	2.5 yellow	3.5 yellow
Solids	Nil	Nil
Peroxide value	0.25	0.2

—*Food Proc. & Packaging (Br.)*, 171-178, May 1961.

Design of Multi-Purpose Pilot Malting Unit

A pilot malting unit was designed to perform three main functions: The comparison of different barley lots using a standard malting procedure; the production of malt under different conditions for pilot brewing; and, the study of malting engineering.

The design of the units incorporates the dual-purpose germination and kilning compartment and damper modultion principles of a new commercial plant. Instrumentation was provided for the three primary functions.

Also discussed are: A new method of compartment temperature control, and a modern system of kiln temperature programming. —*Paper by Blum and Burke*, Amer. Soc. of Brewing Chemists Convention, May 1961.

CIRCLE 80 ON INQUIRY CARD
CIRCLE 81 ON INQUIRY CARD ➔

What can lemon juice do for mayonnaise?

Exchange Lemon Juice, blended with vinegar, produces higher active acidity in the water phase (and lower in the oil phase) without excessive acid odor. It extends shelf life by improving emulsion stability and reducing tendency to go rancid. Constituents in lemon juice will tie-up metallic ions (such as copper and iron) which attack fatty oils of the emulsion. Of course, lemon juice improves flavor and adds a saleable distinction to your label.

For fruit juices?

Lemon juice produces a pleasing, well-balanced tart flavor and blends well with all fruit juices. Besides being a flavor-enhancer, it is nature's finest anti-oxidant, doing the job where other chemical anti-oxidants fail. The natural acids (citric and ascorbic) combine synergistically with other natural reductants in lemon juice to increase their anti-oxidant properties.

For your product?

Send us the coupon today—and let our researchers tell you what lemon juice can do for you.

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Products Sales Dept., 720 E. Sunkist St., Ontario, Calif.

GENTLEMEN: *Our product is* _____

_____ *How can lemon juice help?*

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Exchange

creating the package

FOUR INNER PACKS with three biscuits each are inserted into new 10¼-oz. carton.

Nabisco's Inner Packs Retain Flavor and Freshness

Change in shredded wheat package reduces product breakage and provides more sanitary protection. Entire process automated, too

NABISCO'S SHREDDED WHEAT package has recently attained a new look. Called "Flavor Fresh" Inner Packs and introduced in a 10¼-oz. carton, the package comprises four inner packs of three biscuits each.

The new package offers these four advantages:

- **Retains flavor longer.**
- **Maintains freshness longer.**
- **Reduces breakage considerably.**
- **Provides a more sanitary package.**

Heart of the change involves wrapping three biscuits side by side (long side) in an opaque wax wrap (Riegel Paper, N. Y. C.) and heat sealing to form the inner pack.

ALEX K. PORIANDA
Managing Editor, "Food Engineering"

How Package Changed

Compared to the original 12-oz. carton, the advantages are quite obvious. Formerly, four flat rows of three biscuits each were placed one on top another in a 20-gauge unlined cracker shell. The rows were separated by dividers. Now, the four inner packs are inserted in the same type shell so that each biscuit stands on its side, with three riding vertically in each pack (see photo above).

The sealed inner packs (waxed on one side) help retain flavor, and also set up an effective water vapor barrier to prevent moisture absorption, thereby maintaining freshness. Because the biscuits don't lie flat but stand on a structurally stronger side, there is considerably less breakage of the fragile product. Thus, the amount of chafing shreds has been reduced from 1 oz. in the previous package to ¼ oz. in the new package. Further, the wax wrap forms an extra protective barrier against infestation which can occur during outside shelf storage.

About the only thing that didn't change was the product itself, although its baking changed somewhat.

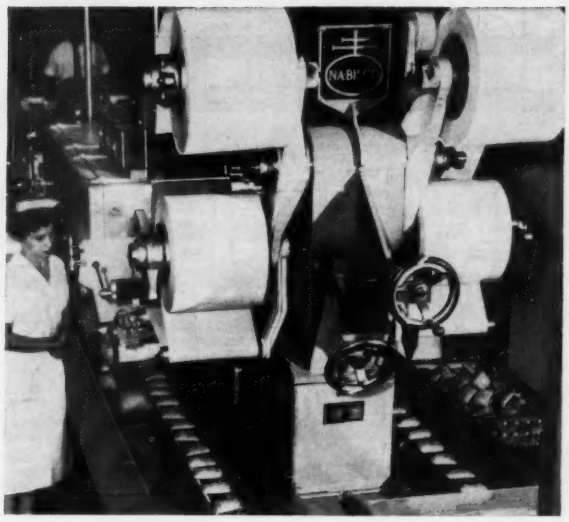
The outer carton (cracker shell) was redesigned to show two

biscuits with fruit—either strawberries, peaches, or bananas. (Nabisco's package designers are Raymond Lowey/William Snaith Associates, N.Y.C.)

The corrugated shipper, holding 24 10¼-oz. cartons, was redesigned to accommodate this new package. Reverse printing on shipper's side boldly promotes inner packs.

While so far only the 12-biscuit unit has been introduced with inner packs, Nabisco has begun producing 6- and 18-biscuit packages which will be marketed very soon.

Unveiling such a packaging innovation is nothing new to Nabisco. Not too long ago, their Ritz and Premium saltine crackers were dressed up in the Stack Pack which became very popular. Company hopes inner pack does for shredded wheat what stack pack did for its products saleswise.



TWIN - PACK machines, designed by Nabisco engineers, automatically wax wrap three shredded wheat biscuits to form inner packs.

Processing Outlined

The completely automatic shredded wheat process follows these steps:

1. Cooking and Forming.

Cleaned wheat is cooked by steam, cooled, and "cured" in large stainless steel tanks until firm. Shredders (about 22 of them) deposit layer on top of layer of wheat shreds onto a moving strip which leads to a rotary cutter where the biscuits are cut.

Cut biscuits are automatically deposited on a moving belt and go into a band oven. Here a major processing change was effected. Formerly, four reel ovens and one "automatic" oven (especially designed for this product) baked the biscuits. Now, two 160-ft. band ovens do the baking at temperatures of 700F. (initially) reduced to 500F. Ovens were made to Nabisco specifications by Spooner Co., England.

3. Twin-Pack Wrapping.

The cooled, baked biscuits are next conveyed to twin-pack machines designed by Nabisco engineers. There are two such machines in each packaging unit. Here three biscuits are automatically wax-wrapped and heat sealed. This is a second major innovation in Nabisco's shredded wheat process.

4. Cartoning and Casing.

A collector groups four inner packs that are inserted into cartons by a Jones cartoner. Final casing involves packing 24 cartons into a case.

Marketing the Package

Shredded wheat's popularity climbed during the war so that Nabisco is now producing well over 2 million cases of this product annually. A plant at Oakland, Calif., produces the biscuit exclusively for the Pacific Coast, while the only other U. S. plant at Niagara Falls produces Triscuit wafers as well. Round the clock production at the latter plant yields more than 2 million biscuits daily.

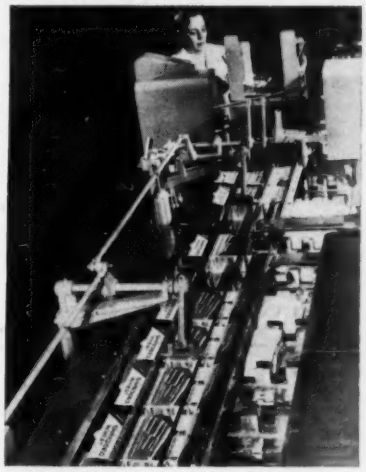
A third plant on the Canadian side of the Falls was the actual launching site for the introduction of the inner pack. Because of the success of this first market venture, market research in the U. S. was unnecessary.

Inner pack's first introduction in the U. S. was in the Southern region on Feb. 26, 1961. Distribution was expanded by regions (Nabisco has six regions nationally) until, finally, the Pacific Coast region joined the others about six weeks later.

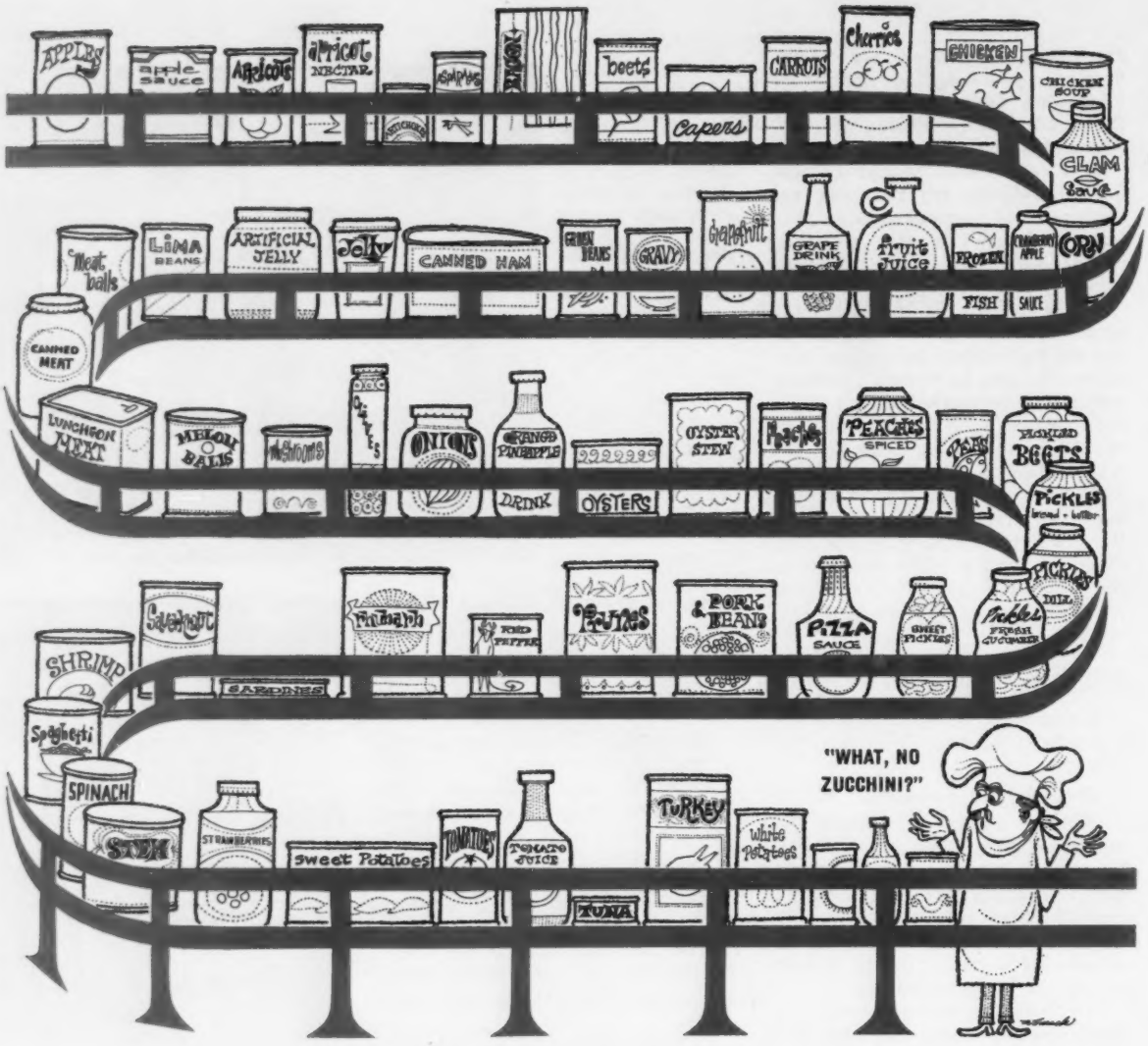
How's the new package doing? Says A. K. Bell, Marketing Mgr. for Cereals, "We've received hundreds of letters from consumers welcoming this change. We should see a boost in sales, judging from results in Canada."

Needless to say, Nabisco's advertising theme for shredded wheat, in addition to product sell, now includes package-features sell. (End)

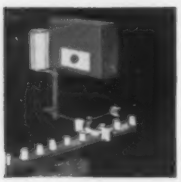
COLLECTOR groups four inner packs for insertion into cartons.



INNER PACKS are automatically inserted into cartons which then go to caser for a 24-pack.



NEW MORTON FLOCRON DISPENSER CUTS CANNING COSTS FOR 63 PRODUCTS!

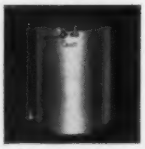


No splash . . . no spill . . . no overfill! Companies who use Morton's amazing Flocron liquid dispenser system to handle any of the 63 different food products listed above report that Flocron avoids the waste inherent in "overflow fill" systems, stops splash loss, and dispenses more than 40 different ingredients with money-saving speed and accuracy.

The versatile Flocron is actually a precise electronic system with photoelectric circuits in a sealed unit and a new lever-type photo switch to activate dispensing. It assures accuracy, even on lines handling up to 300 units per minute! Remote electronic controls permit you to "dial" the exact amount of liquid required for varying can sizes.

Designed for efficient, low cost operation. The Flocron is made of stainless steel and plastic and is constructed to avoid corrosion and lengthy breakdowns that result in costly downtime. There are no valves to stick or clog, and the Flocron is easily cleaned by circulating a detergent solution through the fluid system and following this with a sanitizer. No need to revise production lines. The Flocron can be operated with existing equipment. Scientific Dispensing Company technicians in all areas will assist with installation and servicing.

Some of the liquids you can dispense with the Flocron are: ascorbic acid, beef gravy, brine, concentrated syrup, hot butter, Monosodium Glutamate, spice oils, sugar and brine, tomato puree and vinegar.



MORTON ALSO OFFERS CORROSION-FREE BRINEMAKERS

In addition to the Flocron liquid dispenser, Morton also offers a complete range of Brinemakers, capable of producing up to 800 gals. of saturated pure brine per hour. With the Morton Brinemaker, salt is handled only once at the Brinemaker location from where it may flow or be pumped to the Flocron or other usage points. No space-wasting storage tank needed; no need for costly shut downs for cleaning out impurities.

SCIENTIFIC DISPENSING COMPANY / DIVISION OF

MORTON SALT COMPANY

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FEMA Issues New GRAS List

Association's expert panel judges more flavoring substances as GRAS and is reserving decision on others

FEMA has just issued a list of 662 flavoring ingredients that have been determined by its own expert panel to be generally recognized as safe (GRAS) under conditions of intended use.

This is the second such list released by the Flavoring Extract Manufacturers' Association, and includes those substances listed earlier (see FE April, '61, p. 93).

FEMA's expert panel is still reserving decision on some 130 ingredients pending evaluation of additional evidence.

Substances listed below do not include those which were released previously and which have been published in FE's April issue.

Acetic acid, bornyl ester; Acetic acid, *iso*-bornyl ester; Acetic acid, calcium salt; Acetic acid, carvyl ester; Acetic acid, cyclohexaneethyl ester; Acetic acid, dihydrocarvyl ester; Acetic acid, α,α-dimethylphenethyl ester; Acetic acid, dodecyl ester (Lauryl acetate); Acetic acid, 2-ethyl butyl ester; Acetic acid, *iso*-eugenyl ester; Acetic acid, furfuryl ester; Acetic acid, heptyl ester; Acetic acid, 2-hexenyl ester; Acetic acid, hexyl ester; Acetic acid, isopropyl ester; Acetic acid, methyl ester; Acetic acid, 2-methyl-4-phenyl-2-butyl ester; Acetic acid, neryl ester; Acetic acid, 1,3-nonanediol mixed esters; Acetic acid, nonyl ester; Acetic acid, octyl ester; Acetic acid, 4-phenyl-2-butanol ester; Acetic acid, piperonyl ester; Acetic acid, potassium salt; Acetic acid; *iso*-pulegol ester; Acetic acid, santalyl ester; Acetic acid, tetrahydrofurfuryl ester; Acetic acid, *o*-tolyl ester; Acetic acid, *p*-tolyl ester; Acetic acid, 10-undecene-1-ol ester; Acetic acid, vanillin ester; (tri-) Acetin; Acetoacetic acid, butyl ester; Acetoacetic acid, *iso*-butyl ester; Acetophenone; Acetylcitric acid, tributyl ester; 2-Acetyl-3-phenylpropionic acid, ethyl ester; Aconitic acid, mixed ethyl esters; Acrylic acid, ethyl ester; Adipic acid; Alginates, sodium, calcium and ammonium; 4-Allylveratrole (Eugenyl methyl ether); Angelic acid, *iso*-butyl ester; Anisic acid, methyl ester; Anthranilic acid, butyl ester; Anthranilic acid, linalyl ester; Anthranilic acid, phenethyl ester; Anthranilic acid, terpinyl ester.

Benzoic acid, *iso*-butyl ester; Benzoic acid, eugenyl ester; Benzoic acid, isopropyl ester; Benzoic acid, linalyl ester; Benzoic acid, phenethyl ester; Benzoic acid, propyl ester; Benzoylacetic acid, ethyl ester; 3-Benzyl-4-heptanone; Borneol; *iso*-Borneol; 1-Butanol; 2-Butanone *iso*-Butyl alcohol; Butylated hydroxytoluene (BHT); α-*iso*-Butylphenethyl alcohol; *p-ter*-Butylphenylacetic acid, methyl ester; Butyric acid, allyl ester; Butyric acid, anisyl ester; Butyric acid, cinnamyl ester; *iso*-Butyric acid, citronellyl ester; Butyric acid, decyl ester; *iso*-Butyric acid, α,α-dimethylbenzyl ester; Butyric acid, α,α-dimethylphenethyl ester; Butyric acid, α-ethylbenzyl ester; *iso*-Butyric acid, ethyl ester; Butyric acid, heptyl ester; iso-Butyric acid, heptyl ester; Butyric acid, hexyl ester; Butyric acid, isopropyl ester; iso-Butyric acid, isopropyl ester; Butyric acid, linalyl ester; *iso*-Butyric acid, linalyl ester; Butyric acid, α-methylbenzyl ester; Butyric acid, methyl ester; *iso*-Butyric acid, methyl ester; *iso*-Butyric acid, 2-methyl-4-phenyl-2-butanol ester; Butyric acid, 2-methyl-2-propen-1-ol ester; Butyric acid, neryl ester; *iso*-Butyric acid, neryl ester; Butyric acid, octyl ester; *iso*-Butyric acid, octyl ester; Butyric acid, phenethyl ester; *iso*-Butyric acid, phenethyl ester; *iso*-Butyric acid, 2-phenoxyethyl ester; Butyric acid, 2-phenylpropyl ester; *iso*-Butyric acid, 3-phenylpropyl ester; *iso*-Butyric acid, piperonyl ester; Butyric acid, propyl ester; *iso*-Butyric acid, propyl ester; Butyric acid, rhodinyl ester; *iso*-Butyric acid, rhodinyl ester; Butyric acid, terpinyl ester; *iso*-Butyric acid, terpinyl ester; Butyric acid, tetrahydrofurfuryl ester; *iso*-Butyric acid, *p*-tolyl ester; (tri-) Butyrin; Butyrllactic acid, butyl ester.

Camphene; Caramel colors; Carveol; 4-Carvomenthenol; Cinnamic acid; Cinnamic acid, allyl ester; Cinnamic acid, butyl ester; Cinnamic acid, cinnamyl ester; Cinnamic acid, heptyl ester; Cinnamic acid, isopropyl ester; Cinnamic acid, linalyl ester; Cinnamic acid, phenethyl ester; Cinnamic acid, 3-phenylpropyl ester; Cinnamic acid, propyl ester; Cinnamic acid, terpinyl ester; Citric acid, sodium salt; Citronellal; Citronellyloxyacetaldehyde; Crotonic acid, allyl ester; Cuminaldehyde; Cyclohexaneacetic acid; Cyclohexanebutyric acid, allyl ester; Cyclohexanehexanoic acid, allyl ester; Cyclohexanepropionic acid, allyl ester; Cyclohexanepropionic acid, ethyl ester; Cyclohexanevaleric acid, allyl ester.

δ-Decalactone; 2-Decenoic acid, butyl ester; Dibutyl sulfide; Dihydrocarveol; *p*-Dimethoxybenzene; 2,4-Dimethyl acetophenone; 2,2-Dimethylcrotonic acid, benzyl ester; 2,6-Dimethyl-5-heptenal; 2,6-Dimethyl octanal; 3,7-Dimethyl-1-octanol; α,α-Dimethylphenethyl alcohol; Dimethyl sulfide; 1,3-Diphenyl-2-propanone; δ-Dodecalactone; Dodecanoic acid (Lauric acid); Dodecanoic acid, butyl ester (Butyl laurate); Dodecanoic acid, methyl ester (Methyl laurate); Dodecanoic acid, *p*-tolyl ester (*p*-Cresyl laurate); 2-Dodecenal; Draco rubin, extract.

Erythorbic acid (*iso*-Ascorbic acid); *p*-Ethoxy benzaldehyde; 2-Ethoxy-*p*-cymene (Carvacryl ethyl ether); 2-Ethoxy-*p*-cymene (Carvacryl ethyl ether); 2-Ethylbutyraldehyde; 2-Ethylbutyric acid; 2-Ethylbutyric acid, allyl ester; Ethylene oxide(1); 4-Ethylguaiacol; 2-Ethyl-2-heptenal; Ethyl nitritite.

Farnelsol; *d*-Fenchone; Fenchyl alcohol; Formic acid, anisyl ester; Formic acid, bornyl ester; Formic acid, *iso*-bornyl ester; Formic acid, butyl ester; Formic acid, *iso*-butyl ester; Formic acid, Cinnamyl ester; Formic acid, citronellyl ester; Formic acid, α,α-dimethylphenethyl ester; Formic acid, eugenyl ester; Formic acid, *iso*-eugenyl ester; Formic acid, heptyl ester; Formic acid, hexyl ester; Formic acid, isopropyl ester; Formic acid, linalyl ester; Formic acid, α-methylbenzyl ester; Formic acid, neryl ester; Formic acid, octyl ester; Formic acid, phenethyl ester; Formic acid, 3-phenylpropyl ester; Formic acid, propyl ester; Formic acid, rhodinyl ester; Formic acid, terpinyl ester; Fumaric acid; 2-Furanacrylic acid, propyl ester; 2-Furanbutyric acid, *iso*-amyl ester; 2-Furanmethanethiol (Furfuryl mercaptan); 2-Furanpropionic acid, *iso*-amyl ester; 2-Furanpropionic acid, *iso*-butyl ester; 2-Furanpropionic acid, ethyl ester; Furoic acid, allyl ester; Furoic acid, amyl ester; Furoic acid, hexyl ester; Furoic acid, methyl ester; Furoic acid, phenethyl ester; Furoic acid, propyl ester; Furyl acrolein; 1-Furyl-2-propanone; Fusel, oil, refined(2).

Guaiac gum, extract; Guar, gum.

Heptanal; a,3-Heptanedione; Heptanoic acid, allyl ester; Heptanoic acid, butyl ester; Heptanoic acid, *iso*-butyl ester; Heptanoic acid, methyl ester; Heptanoic acid, octyl ester; Heptanoic acid, propyl ester; 1-Heptanol; 3-Heptanone; Hexadecanoic acid (Palmitic acid); Hexadecanoic acid, ethyl ester (Ethyl palmitate); Hexanoic acid, butyl ester; Hexanoic acid, *iso*-butyl ester; Hexanoic acid, ethyl ester; Hexanoic acid, hexyl ester; Hexanoic acid, isopropyl ester; Hexanoic acid, linalyl ester; Hexanoic acid, methyl ester; Hexanoic acid, 3-phenylpropyl ester; Hexanoic acid, propyl ester; 2-Hexenoic acid, methyl ester; 2-Hexen-1-ol; 2-Hexen-1-ol; *p*-Hydroxybenzoic acid, butyl ester; *p*-Hydrozybenzoic acid, methyl ester; *p*-Hydroxybenzoic acid, propyl ester; 5-Hydroxy-4-octanone.

p-Isopropyl acetophenone; *p*-Isopropylbenzyl alcohol; 3-(*p*-Isopropyl) phenyl Propionaldehyde; Lactic acid, butyl ester; Lavulinic acid; Levulinic acid, butyl ester.

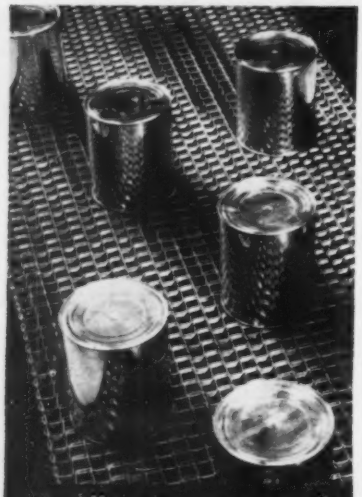
1,8,*p*-Menthadien-7-ol; (d)-*neo*-Menthol; Methanethiol (Methyl mercaptan); β-Methiopropionaldehyde (Methional); 4'-Methoxyacetophenone; 2-Methoxy-4-methyl phenol; 4-(*p*-Methoxyphenyl)-2-butanone; 1-*p*-Methoxyphenyl-2-propanone; 2-methoxy-4-vinyl phenol; *o*-Methylanisole; α-Methylbenzyl alcohol; 2-Methylbutyraldehyde; Methyl cellulose; α-Methylcinnamaldehyde; 3-Methylcyclopentane-1,2-dione; 5-Methylfurfural; 2-Methylheptanoic acid; 6-Methyl-5-hepten-2-one; 2-Methyl-3-(*p*-isopropylphenyl) butanal; 2-Methyloctanal; 4-Methyl-2,3-pentanedione; 2-Methylpentanoic acid; 4-Methylpentanoic acid, methyl ester; 4-Methyl-2-pentanone; β-Methylphenethyl alcohol (Hydratropyl alcohol); *p*-Methylphenylacetaldehyde; 3-Methyl-2-phenyl-

Note (1): As a fumigant for whole and ground spices, provided that residues of ethylene oxide do not exceed 50 p.p.m.

Note (2): Assuming that refined fusel oil is mixed with amyl alcohols, predominantly 3-Methyl-1-butanol.

LA PORTE

FLEXIBLE STEEL CONVEYOR BELTS



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THE flexible open-mesh design of LaPorte Belts offers definite money-saving advantages to food manufacturers. For example, fruits and vegetables cannot roll off. Sorting, grading, washing, canning, dehydrating and freezing are speeded up. The impenetrable surface, that resists oils, grease and detergents, safeguards products against off-flavors and odors. In addition, these temperature-proof belts maintain a perfectly flat surface on filling and sealing tables. Easily sterilized with a steam gun while in motion.

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butyraldehyde; 5-Methyl-1-phenyl-2-pentanone; Myrcene.

Nerol; Nerolidol; 2,6-Nonadienol; Nonanoic acid; Nonanoic acid, allyl ester; Nonanoic acid, methyl ester.

Octadecanoic acid; Octadecanoic acid, butyl ester; Octadecanoic acid, glyceryl monester; Octadecanoic acid, propylene glycol monester; Octanoic acid, heptyl ester; Octanoic acid, hexyl ester; Octanoic acid, linalyl ester; Octanoic acid, methyl ester; Octanoic acid, nonyl ester; Octanoic acid, octyl ester; 2-Octanol; 3-Octanol; 2-Octanone; 3-Octanone; 3-Octanon-1-ol; Oleic acid, ethyl ester.

Pentanal; 2,3,-Pentanedione; 2-Pentanone; 4-Pentenoic acid; Phenethyl alcohol; Phenoxyacetic acid; Phenoxyacetic acid, allyl ester; Phenylactic acid, allyl ester; Phenylacetic acid, benzyl ester; Phenylacetic acid, butyl ester; Phenylacetic acid, *iso*-butyl ester; Phenylacetic acid, cinnamyl ester; Phenylacetic acid, citronellyl ester; Phenylacetic acid, *iso*-eugenyl ester; Phenylacetic acid, isopropyl ester; Phenylacetic acid, octyl ester; Phenylacetic acid, phenethyl ester; Phenylacetic acid, propyl ester; Phenylacetic acid, rhodinyl ester; Phenylacetic acid, santalyl ester; Phenylacetic acid, *p*-tolyl ester; 4-Phenyl-2-butanol; 4-Phenyl-3-buten-2-ol; 4-Phenylbutyric acid, ethyl ester; 4-Phenylbutyric acid, methyl ester; 1-Phenyl-3-methyl-3-Pentanol; 1-Phenyl-1-propanol; 3-Phenyl-1-propanol; 2-Phenylpropionaldehyde (Hydratropaldehyde); 3-Phenylpropionaldehyde; 3-Phenylpropionic acid; 3-Phenylpropionic acid, ethyl ester; 3-Phenylpropionic acid, methyl ester; *o*-Phosphoric acid, disodium salt; *o*-Phosphoric acid, tricalcium salt; β-Pinene; Piperidine; Piperine; *d*-Piperitone; 1-Propanol; 2-Propene-1-thiol (Allyl mercaptan); 4-Propenylveratrole (*iso*-Eugenyl methyl ether); Propionaldehyde; Propionic acid, allyl ester; Propionic acid, anisyl ester; Propionic acid, *iso*-bornyl ester; Propionic acid, butyl ester; Propionic acid, citronellyl ester; Propionic acid, cyclohexyl ester; Propionic acid, hexyl ester; Propionic acid, isopropyl ester; Propionic acid, linalyl ester; Propionic acid, α-methylbenzyl ester; Propionic acid, methyl ester; Propionic acid, neryl ester; Propionic acid, octyl ester; Propionic acid, phenethyl ester; Propionic acid; 3-phenylpropyl ester; Propionic acid, rhodinyl ester; Propionic acid, terpinyl ester; Propionic acid, tetrahydrofulfuryl; *p*-Propyl anisole; α-Propylphenethyl alcohol; *iso*-Pulegol; Pulegone; *iso*-Pulegone; Pyridine; Pyruvaldehyde; Pyruvic acid; Pyruvic acid, ethyl ester.

iso-Quinoline.

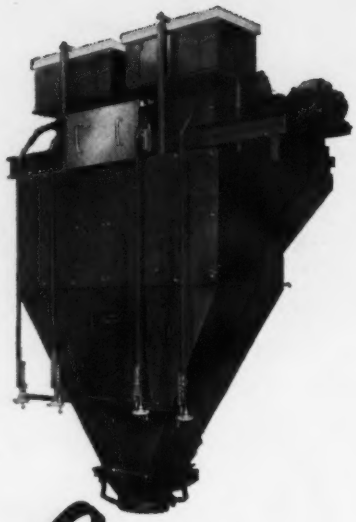
Saccharine, sodium salt; Salicylaldehyde; Salicylic acid, *iso*-amyl ester; Salicylic acid, benzyl ester; Salicylic acid, *iso*-butyl ester; Salicylic acid, phenethyl ester; Santalol; Sebacic acid, dibutyl ester; Sebacic acid, diethyl ester; Skatole; Sodium hexametaphosphate; Sorbic acid, allyl ester; Sorbic acid, ethyl ester; Succinic acid, diethyl ester; Succinic acid, dimethyl ester; Sucrose octaacetate; Sulfur dioxide.

Tannic acid; Tartaric acid, diethyl ester; Terpinolene; Tetradecanoic acid (Myristoc Acid); Tetradecanoic acid, ethyl ester; Tetradecanoic acid, methyl ester; Tetrahydrofurfuryl alcohol; Tetrahydro-ψ-ionone; Tetrahydrolinalool; Thienyl thiol; Thymol; Tiglic acid, ethyl ester; Tiglic acid, phenethyl ester; α-Toluenethiol (Benzyl mercaptan); 4-(*p*-Tolyl)-2-butanone; 2-(*p*-Tolyl) propanal; 2-Tridecenal; 2,3-Undecadione.

2,3-Undecadione; Undecanal; 1-Undecanol; 2-Undecanone; 9-Undecenal; 10-Undecenal; 10-Undecenoic acid, allyl ester; 10-Undecenoic acid, butyl ester; 10-Undecylenic acid, ethyl ester; 9-Undecylenic acid, methyl ester.

iso-Valeric acid, allyl ester; Valeric acid, bornyl ester; *iso*-Valeric acid, bornyl ester; *iso*-Valeric acid, *iso*-bornyl ester; Valeric acid, butyl ester; *iso*-Valeric acid, butyl ester; Valeric acid, citronellyl ester; *iso*-Valeric acid, isopropyl ester; *iso*-Valeric acid, linalyl ester; *iso*-Valeric acid, menthyl ester; Valeric acid, methyl ester; *iso*-Valeric acid, methyl ester; *iso*-Valeric acid, neryl ester; *iso*-Valeric acid, nonyl ester; *iso*-Valeric acid, octyl ester; *iso*-Valeric acid, phenethyl ester; *iso*-Valeric acid, 3-phenylpropyl ester; *iso*-Valeric acid, propyl ester; *iso*-Valeric acid, rhodinyl ester; *iso*-Valeric acid, terpinyl ester; Veratraldehyde (Vanillin methyl ether).

Zingerone.



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James V. Bassett

Heads Borden International . . . James V. Bassett has been named executive v.-p. of the newly formed International Div. of Borden Foods Co. The new division will embrace all of the company's export and foreign operations with sales in over 100 countries and manufacturing facilities in 10 foreign nations.

Four other appointments —Edward J. Cruger, Walter R. Olmstead, and Victor J. Stolfi, formerly assistant v.-p.'s of foreign operations, have been boosted to v.-p.'s of Borden International. Neil J. Denaut, director of overseas development, has been named assistant v.-p.

Mr. Bassett, formerly export and foreign operations v.-p., joined Borden in '42 as assistant to the general controller. In '45 he was placed in charge of export operations in Central America and northern South America. He was elevated to foreign operations v.p. in '52 and in '58 was named v.-p. of Borden Foods Co.

Samuel F. Kinkle

AACT Award Recipient . . . Samuel F. Hinkle, Hershey Chocolate Corp. president, has received The Stroud Jordan Award, highest honor bestowed by the American Assn. of Candy Technologists.

As eleventh recipient of the award, Mr. Hinkle was recognized for his outstanding contributions to the candy technology field.

In cooperation with the U. S. Quartermaster Corps, Mr. Hinkle assisted in the production of a special chocolate bar which would sustain life under the most adverse circumstances and would not melt under extreme heat. In recognition of this effort, he was officially recognized by the Quartermaster Corps during WW II.

Mr. Hinkle joined Hershey in '24 as chief chemist and served in this capacity until '47 when he became plant manager. In '56 he was named president of the organization.

Don. F. Copell

New W. E. Long Pres. . . . Don F. Copell has been elected president and general manager of The W. E. Long Co. — Independent Bakers' Cooperative, rendering management services to 88 bakeries. The Long organization has combined sales in excess of $200 million and operates in 37 states, Canada, Hawaii, and Puerto Rico.

Mr. Copell was formerly v.-p. of Wagner Baking Corp., Newark, N. J., and is past president of the N. J. Society for Advancement of Management, Bakers Club' and American Society of Bakery Engineers. He serves on the manufacturing council of the American Management Assn.

Mr. Copell is the recipient of the Gilbreath Medal for outstanding contributions to industrial engineering and management.

Personnel

Dr. J. E. Killinger moves up to product application and development v.-p. at Penick & Ford Ltd., Inc. **L. S. Poer** has been promoted to v.-p. and marketing director for food industries and allied trades, and **Dr. R. E. Brouillard** takes over as v.-p. and marketing director for paper & textiles industries.

Ernest L. Lowry is now executive v.-p. of The Squirt Co.

Delbert F. Wright, administration and employee relations v.-p. at General Mills, has been elected to the board.

W. M. Tucker becomes new products coordinator at General Foods' research center, Tarrytown, N. J.

J. C. Lockwood, president, Lever Bros. Ltd., Toronto, has been elected a director of Grocery Products Manufacturers of Canada.

Edward M. Muldoon moves up to Beatrice Foods Co. v.-p.

David Sykes, Plantation Chocolate Co., takes over as board chairman of National Confectioners Assn.

Robert L. Gibson is new senior v.-p. at Libby, McNeill & Libby.

J. W. Flypaa assumes post as sales development director for The Quaker Oats Co.

Dr. John M. Jackson, of American Can Co.'s Research Div., is now president-elect of Institute of Food Technologists.

Franklin J. Enos has been elected senior-v.-p. of R. T. French Co. with **Dr. John M. Fogelberg** and **T. Bernard Jones** moving up to v.-p. posts.

James J. Tormey, v.-p. and and sales manager of Lyndonville Canning Co., takes over as president of Processed Apples Institute.

Britton E. Balzerit has been named market development manager at Corn Products Sales Co.'s Industrial Div.

Clarence W. Gardiner moves up to administrative assistant to Wendell P. Nolan, president of Keebler Biscuit Co.

Henry Cragg, Franklin E. Penn, and **Hugh W. Schwartz,** v.-p.'s at Minute Maid Co., have been appointed to advisory board of directors of Coca-Cola Co.'s Minute Maid Div.

Kelly Y. Siddall, administrative v.-p. and director of The Proctor & Gamble Co., retired after 35 years service with the firm.

George L. Clements, president of Jewel Tea Co., has been named program committee chairman of the Fifth International Food Congress & Exhibition to be held in the New York Coliseum, Sept. 8-16, 1962.

John E. Repko Jr. and **Peter Borie** assume v.-p. posts at Pepsi-Cola Co.

Kenneth W. Charles has been named operations v.-p. for Dominion Dairies Ltd., Toronto.

Harold K. Wilder takes over as managing director of Food Industry Assn. Executive.

J. Harold Erikson Jr. moves up to treasurer of American Molasses Co.

Industry

Penick & Ford Ltd. and **Morningstar - Paisley Inc.** directors have approved merger plan under which M-P would operate as division of P&F.

Beatrice Foods Co. has acquired assets and business of **Westerville Creamery Co.,** Westerville, O.

General Foods Corp., through its Swiss subsidiary, purchased majority in-

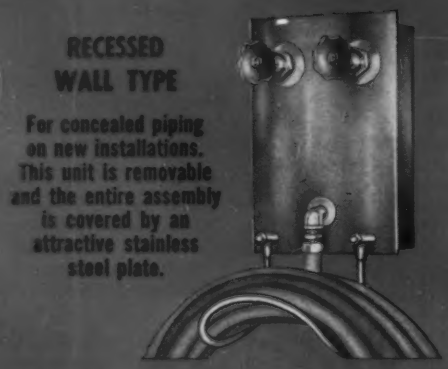
The Answer to Your Wash-Up Problems!

INSTANT HOT WATER MAKER

Equipped with 50 foot hose, water saver and spray nozzle. Mixes Steam and Cold water with no chance of Steam Burns! Economical and easy to use.

OPEN WALL TYPE

Hot and Cold Water or Steam and Cold Water right where you need it.



RECESSED WALL TYPE

For concealed piping on new installations. This unit is removable and the entire assembly is covered by an attractive stainless steel plate.

Consult your dealer for details and prices or write directly to us.

STRAHMAN VALVES, Inc.
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terest in **Sulta S. A.** at Bray-Sur-Seine, France.

H. J. Heinz Co. is buying **Hachmeister Inc.**, Pittsburgh-based manufacturer of baking ingredients. Both boards have approved acquisition.

Produce Processors Inc., Windsor, N. C., begin first commercial production of pre-cooked instant sweet potato flakes at newly constructed plant.

Food Corp. of America, Minneapolis, a newly formed organization, has raised over $2 million in notes, debentures, and equity for acquisition of active, producing, independent food processing plants, through capital expenditures, long term financing, and merger.

Alta Vinyards Co. has completed arrangements for acquisition of **Garrett & Co.** which includes Virginia Dare, Garrett's, and I.V.C. brand wines.

Canada Dry Corp. has licensed 17 bottler-distributors in 11 foreign countries since last October, with beverage line marketed in five nations for first time.

Lucky Lager Brewing Co. completed first phase of proposed $8 million expansion with completion of construction on Salt Lake City brewery.

International Salt Co. will take over **Pfeiffer's Food Products Inc.**, Buffalo-based salad dressing producer.

Associated Industries

Atlas Chemical Industries Inc. is the new official corporate name of Atlas Powder Co.

Cherry-Burrell Corp. plans to market fast hardening, rack-type freezing systems under their trademark.

AviSun Corp.'s new 100 million-pound-per-year polypropylene plant in New Castle, Del. begins operations next month.

American Can Co.'s Marathon Div. has begun construction of a pilot plant that will enable consolidation of long-range, developmental manufacturing activities.

VAREC Inc. is the new corporate name of Vapor Recovery Systems Co.

Arabol Mfg. Co., producer of industrial adhesives, opened a new plant in Portland, Ore. to service Pacific Northwest.

A. E. Staley Mfg. Co. has elected **L. E. Doxsie** to post of v.-p. of corn, grocery products, and overseas divisions, succeeding L. S. Roehm.

Deaths

Clarence S. Decker, 64, general traffic manager of The Borden Co.

DUAL-PURPOSE HELICOPTER is tried on for size by executives of Hollymatic Corp., Chicago food processing machine manufacturer, where "whirlybird" doubles for business travel and as a promotion vehicle for consumer awareness campaign—star attraction of supermarket and shopping plaza one-day stands.

CIRCLE 88 ON INQUIRY CARD

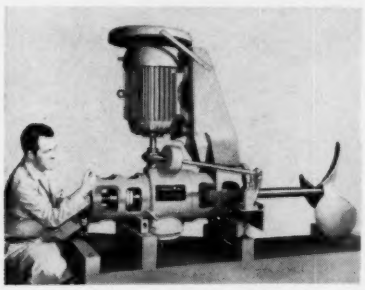
new equipment & supplies

Sanitary Rubber Tubing Has Teflon Liner

Specifically designed for handling of soups, juices, milk, and edible oils is a neoprene-rubber tubing lined with Teflon.

Called Safe-T-Line, it does not impart any taste or odors to fluids, and resists temperatures to 300F. Tube sizes range ¼-½ in i.d., with working pressures to 125 psi.—*W. S. Shamban & Co., Culver City, Calif.*

Circle 401 On Inquiry Card



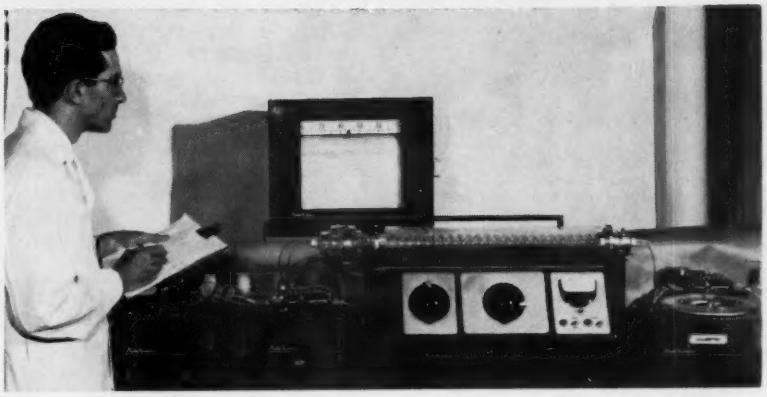
New Mixers Cut Costs

Major innovations in side-entering mixer technology offer new models with greater flow or blending capacity and considerably lower installation and operating costs.

Called Lightnin NSE, the line includes three basic sizes for applications ranging 1-50 hp. Mixers are right-angle spiral bevel gear units with hollow-quill speed reducers. Increased flow of these mixers can eliminate multiple-unit installations—a single 50-hp. mixer will do the job of three conventional 25 hp. units.

An auxiliary line of side-entering mixers (Series RSE) is also available for installations not requiring the shock-load protection afforded by hollow-quill construction and independent bearing support.—*Mixing Equipment Co., Rochester, N. Y.*

Circle 402 On Inquiry Card



Automates Kjeldahl Nitrogen Analyses

Of particular interests to the food industry, this unit offers rapid, automatic Kjeldahl nitrogen analyses.

Known as the Automatic Digestor/Analytical System, it reportedly enables a single lab operator to do as many as 320 nitrogen analyses per 8-hr. shift. And equally important, the system is adaptable to continuous-automatic process monitoring. Reported accuracy of the system is ±1%.

In the laboratory, this unit not only replaces the cumbersome and time-consuming classical Kjeldahl technique, but minimizes space requirements and eliminates the need for glassware and its repeated cleaning. One digestor system occupies about one-sixth the lab space required by classical equipment, and the new unit is completely self-cleansing.

The digestor is integrated with maker's standard analytical system in which a proportioning pump provides a continuous supply of sample and reagents. The new system accomplishes both reductive and oxidative types of digestion. Analytical results are permanently recorded on a graphed readout.

The digestor vessel is a Pyrex tube (23 in. long x 1.7 in. dia.) with helical indentations. When the tube is rotated, liquid introduced at one end is continually conveyed in individual segments to the other extremity. The vessel rotates visibly within a semi-circular, heat-controlled chamber where variable-speed rotation is achieved by a voltage-controlled motor.

Adjusting the speed of rotation controls the duration of the digestion phase. An electronic-type, dual-temperature control permits heat adjustment from room temperature to about 700C. at each of two separate stages—important for controlling the length of the digestion period.

On emerging from the digestion

SERVICE CENTER

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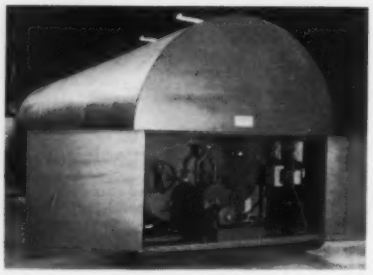
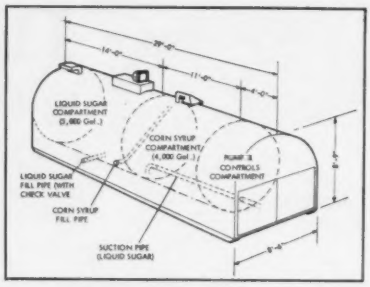
vessel, an aliquot of the highly concentrated digested solution is removed, diluted, cooled and aspirated through the system by a second pump for continuous analysis and permanent recording of results—*Technicon Controls, Inc., Chauncey, N. Y.*

Circle 403 on Inquiry Card.



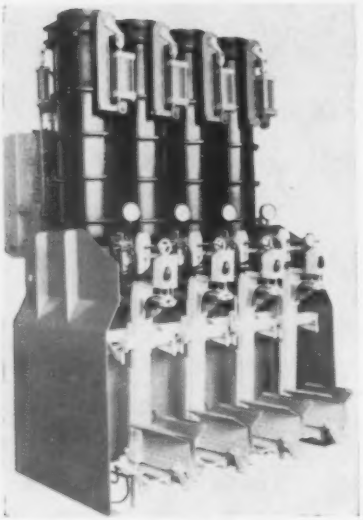

LIQUID SUGAR COMPARTMENT (5,000 Gal.)
CORN SYRUP COMPARTMENT (4,000 Gal.)
PUMP & CONTROLS COMPARTMENT
LIQUID SUGAR FILL PIPE (WITH CHECK VALVE
CORN SYRUP FILL PIPE
SUCTION PIPE (LIQUID SUGAR)

Storage Unit Provides Blending of Sugar Syrups

Greater economy, versatility, and control in blending of corn syrup and liquid sugar are reported advantages of this storage and blending unit. Blending accuracy is within ½%.

Called "Stablend," unit enables mixing in any desired ratios to take full advantage of functional properties of each sweetener, as well as price fluctuations of cane and beet sugar. System has three compartments to accommodate 4,000 gal. of corn syrup, 5,000 gal. of liquid sugar, and pump and controls.—*A. E. Staley Mfg. Co., Decatur, Ill.*

Circle 404 on Inquiry Card.



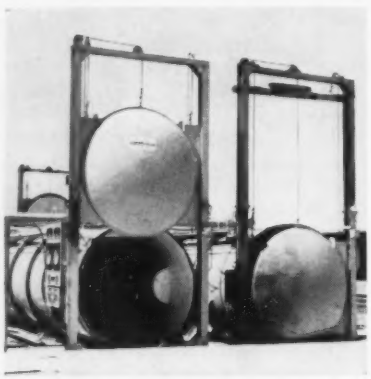
Ups Bagging Efficiency

Higher output and greater packaging economy are offered by this new multi-wall bag packer.

Called "Force Flow," it features a pressure chamber that 'densifies' powders and free-flowing granular materials. Thus, they pack faster and provide a more tightly filled bag. For many products, this permits a reduction in bag size.

Unit is easily adjustable for quick changeover to different products and different bag sizes. It handles 25- to 100-lb. sewn or pasted valve bags, and is available in one- to four-tube models. Up to 28 bags per min. can be packed on a four-tube model. Weight accuracy is within ±4 oz. for most products.—*St. Regis Paper Co., New York City.*

Circle 405 on Inquiry Card.

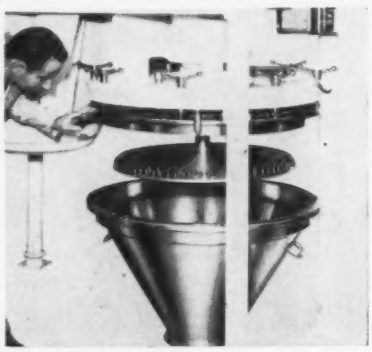


Vacuum Unit Automates Cooling of Produce

This automated vacuum-cooling plant reportedly eliminates most of the conventional manual operations. The entire processing cycle is controlled by a switch, although manual operation is possible if required.

Automation not only makes the plant simple to operate, but precludes the possibility of production delays or produce damage due to faulty operation. Illustrated plant has two 12-pallet tubes with capacity of 2½-3 cars of produce per hr.—*McDonough Steel Co., Oakland, Calif.*

Circle 406 on Inquiry Card.



High-Speed Impact Mill Is Easily Cleaned

Easier cleaning and high-speed operation are features of this stainless-steel centrifugal unit.

Known as Model 51000, its quick-disconnect provisions enable removal and replacement of all components in 20 min. With a spare set of components, batch operations can be put on an almost continuous basis.

Rotor speeds to 5000 rpm. provide material velocities in excess of 40,000 ft. per min. and resulting impact energy ranging 6800 ft.-lb. of material processed. Unit may be sealed for inert atmosphere operation since it withstands internal pressure surges to 100 psi.

The mill has a 27-in. rotor and mounts a 15-75 hp. motor, depending on rotor speed and capacity required.—*Entoleter, Inc., New Haven, Conn.*

Circle 407 on Inquiry Card.

FOR MORE INFORMATION...

... simply circle key item number on handy Inquiry Card—back of book. Then print your name and address, and mail. For your convenience, these items are also listed and keyed in Reader Inquiry section.

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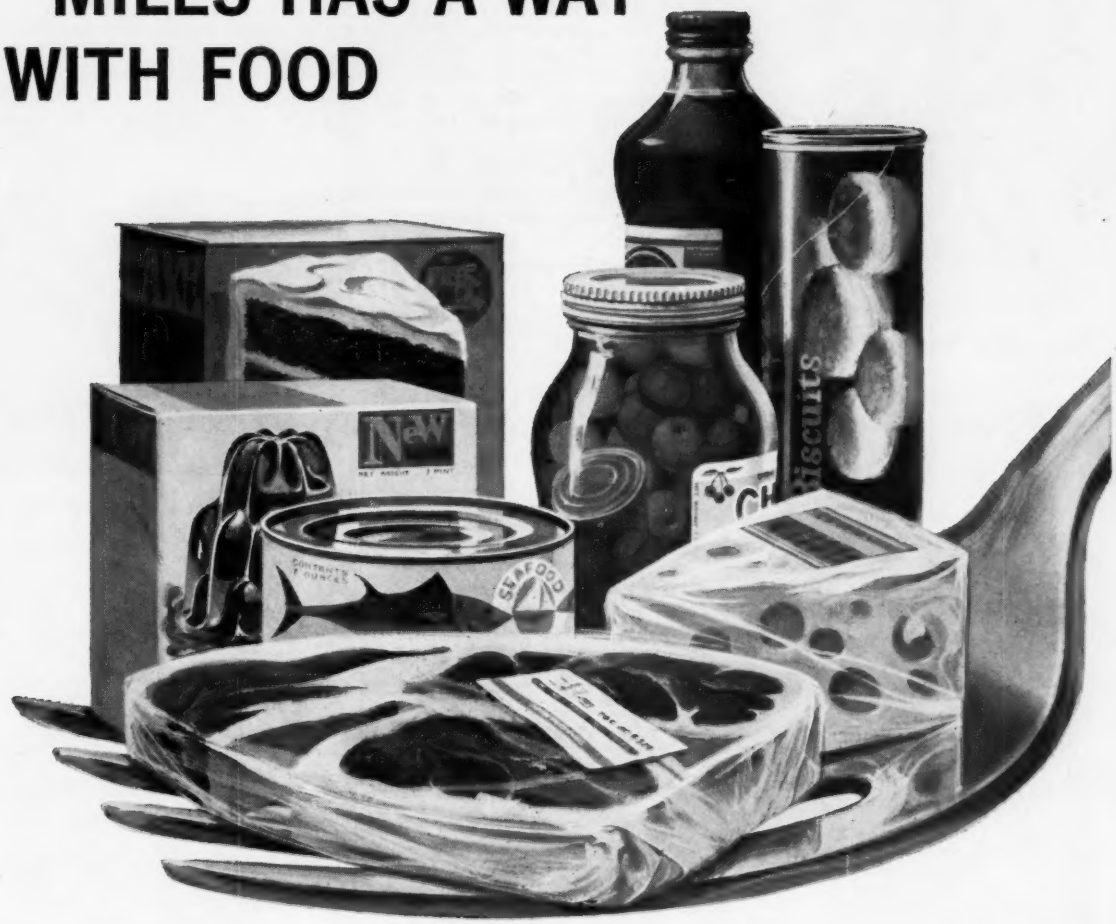
MILES HAS A WAY WITH FOOD



to prolong shelf life, protect color, tenderize, adjust pH, speed processing!

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WITH A WIDE CHOICE OF ENZYMES, Miles is not limited to a few products from which to choose the proper enzyme to do *your specific job*. Selecting from the widest range of commercial enzymes available — manufactured by its famous Takamine plant — Miles' sales and technical service personnel can pick the enzyme to meet your requirements accurately, objectively and economically — not just "come close."

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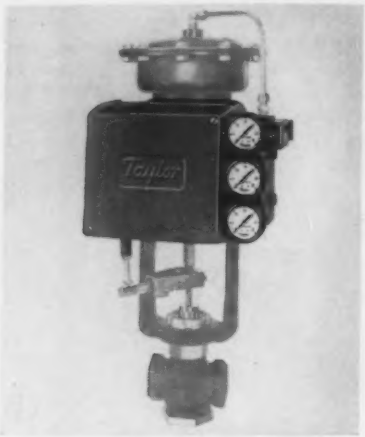


Versatile Valve Positioner

Versatility is a special feature of this valve positioner, whose design is based on the force-balance principle.

Known as 100N Series, it may be used either as a simple controller or as a position-indicator-transmitter—in addition to its prime function of providing fast, positive response for diaphragm actuators. Excellent linearity between controller output pressure and the resulting valve stroke enables using the unit with either direct- or reverse-acting response. Field adjustments and calibration procedures require only a screwdriver and a wrench.

Optional components: A by-pass unit which enables the controller air signal to be diverted directly to the actuator diaphragm so that the positioner can be removed for servicing without loss of process control; a volume booster supplying up to four times the standard output; and pressure gages for monitoring the supply, positioner input, and valve actuator pressures.—*Taylor Instrument Cos., Rochester, N. Y.*

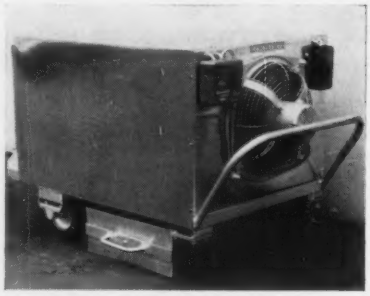
Circle 408 on Inquiry Card.

In-Steam Refractometer Gages Opaque Liquids

Density of fluid process streams —which are highly viscous, extremely dark, or opaque—may now be accurately gaged by a new in-line refractometer.

A significant feature of the unit, which uses the critical-angle technique, is that it measures the refractive index at the surface of a liquid sample. Since surface reflection requires no penetration of the light beam into the solution, the instrument may be used for highly opaque and various murky solutions and suspensions, as well as transparent solutions.—*Waters Associates, Framingham, Mass.*

Circle 409 on Inquiry Card.



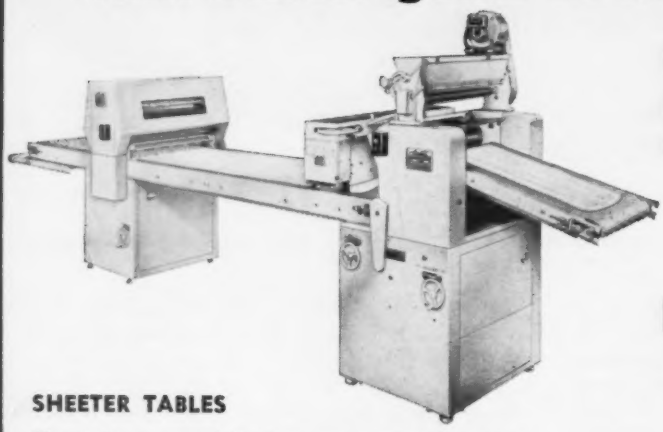
Portable Dehumidifier

Completely self-contained and requiring only electrical connection, this portable dehumidifier removes 5 gal. of water per 24 hr. Its rug-

(Continued on page 94)

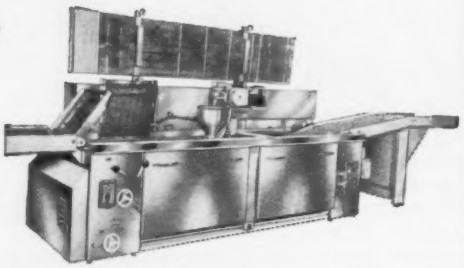
from butter gems to hors d'oeuvres...

this Anets equipment produces greater variety and output at less cost!



SHEETER TABLES

Here's the sure, quick, easy way to meet the growing demand for variety and specialty foods, overcome rising labor costs and shortages of skilled help. Install Anets Sheeter Tables with automatic accessories. This equipment sheets — cross-rolls — cuts — forms — fills — finishes sweet goods, breads, buns, butter gems and a variety of specialty products *automatically* at a fractional cost of manual methods.

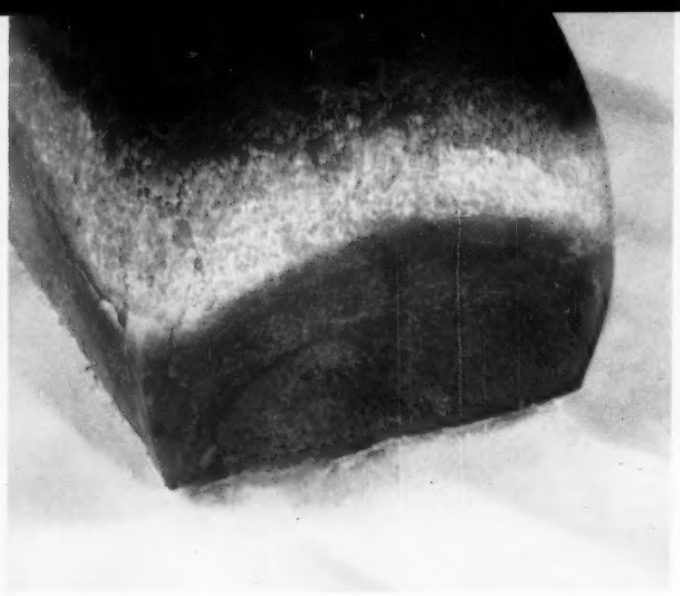


PRODUCTION FRYERS

Now — Anets precision equipment complements the technical formulas of food engineers to deliver as many as 900 dozen delicious donuts per hour. Fried pies, peanuts, t-v snacks, potato pancakes and other fried foods are produced in equally high volume at less cost with an Anets Production Fryer.

Write for complete details.

ANETSBERGER BROTHERS INC. 167 NORTH ANETS DRIVE NORTHBROOK, ILLINOIS



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Special Handling Problems?

...Try Economical tote boxes, trays, flats made of MARLEX*

"What are some of the ways for improving food handling efficiency?" It's a recurring question these days for those engaged in marketing, processing, and mass feeding . . . and an urgent one in the face of rising labor costs. One answer lies in the increasing variety of special and multi-purpose tote boxes, flats, storage units, and containers in use today. We know because, happily for us, our MARLEX high density plastic is a very popular material for these units.

When made of MARLEX, food handling units are almost indestructible—tough, durable, lightweight . . . resistant to denting, cracking, acids, alkalies, greases, fungi, rot, corrosion . . . non-absorbent and capable of withstanding temperatures from —180° F to 250° F (can be steam sterilized).

A wide variety of units made of MARLEX are commercially available from leading distributors. Contact them or see your plastic fabricator who can mold or thermo-form units for your special needs.

PHILLIPS 66 MARLEX PLASTICS

*MARLEX is a trademark for Phillips family of olefin polymers.

PHILLIPS CHEMICAL COMPANY
Bartlesville, Oklahoma
A subsidiary of Phillips Petroleum Company

ged construction and easy portability offer application in many food-plant areas.

Called Dryzair, it contains a ½-hp. condensing unit using Refrigerant 12. A 3-kw. heating element on the outlet grill can deliver air ranging 55-70F. Circulation is provided by a 12-in.-dia. fan that handles 33,000 cfm. Dimensions: About 4 ft. long, 2 ft. wide, 2⅓ ft. high. Weight: 354 lb.

Condensate is collected in a 5-gal. container beneath the unit, or pipe connections can be made for remote drainage. The evaporator, an aluminum-finned copper tube, is connected to the condenser by an expansion valve, constant-pressure valve, and heat exchanger. —*O. N. Beck & Co., London England.*

Circle 410 On Inquiry Card

Compact Butterfly Valves, for pipes ranging 2-18 in. dia., have "O"-Ring seals for positive closure, require no lubrication. They open or close in a quarter turn.—Lunkenheimer Co., Cincinnati.

Circle 411 On Inquiry Card

Gross-Weighing System (G18C) for bagging of soft sugar and similar sticky items automatically fills five 100-lb. bags per min. Accuracy is ±2 oz. Unit consists of belt feeder, clamp-type bag holder with filler spout, and flexure plate scale.—Thayer Scale Corp., Pembroke, Mass.

Circle 412 On Inquiry Card

Continuous Level Indicator (Contimitor) provides control of fluids and solids in tanks or hoppers, also foam detection and vibration measurement. Capacity - operated monitor is specially designed for extreme stability. — Electronic Machine Co. Ltd., Surrey, England.

Circle 413 On Inquiry Card

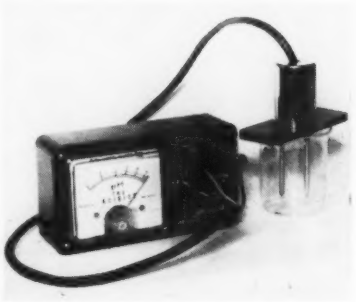
Cross Grain Moulder-Panner (Model K-6) affords easier cleaning, better production control, and increased safety. Integral belt and belt frame are readily removed for complete cleaning of the tubular frame.—J. H. Day Co., Cincinnati.

Circle 414 On Inquiry Card

Freeze-Dry Units, for research and small-scale production, offer full sample visibility and automatic, sterile operation. Three self-contained models take product loads of 15, 40, and 100 lb., respectively. — Repp Industries, Inc., Gardiner, N. Y.

Circle 415 On Inquiry Card

For the Lab



Quickly Gages pH

This easy-to-use pH meter offers an accurate reading in 2-3 min.

Designed for general use in quality control and production, it gages both semi-solids and liquids. All that's required is to insert the metal rods into the test sample. Unit (Model M2) requires no electric current or battery, and no chemicals to re-fill.

Meter weighs only 2 lb., and is 2½x5½x6 in. — *Kel Instruments Co., Inc., New Brunswick, N. J.*

Circle 416 On Inquiry Card

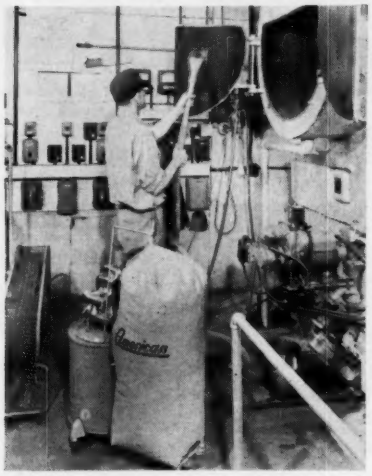
Automatic Titrator performs any titration in which end point can be related to a reproducible electrode potential. Unit (Titrion) is accurate to ±0.1 pH with elapsed time of only 1-1½ min. Automatic features include electronic sensing of end point and magnetic stirring. —Coleman Instruments, Inc., Maywood, Ill.

Circle 417 On Inquiry Card

Tracking Accuracy Control for maker's I-R spectrophotometers minimizes spectra inaccuracies in frequency and band intensity. The accessory (TAC) provides three automatic functions: Slit control, speed and period suppression.—Beckman Instruments, Inc., Fullerton, Calif.

Circle 418 On Inquiry Card

Plant Sanitation & Maintenance



Easier Boiler Cleaning

Cleaning of boilers is greatly simplified with this heavy-duty vacuum. Its special fire resistant cloth filter traps all soot loosened by uniquely designed cleaning tools.

Kit consists of paw tool for removing soot and scale from flat surfaces in fire box, boiler-tube-expansion scraper cones from 2½-4 in. dia., by 5-in. wire brush, and a 28-in. steel service tool which concentrates maximum suction power at the flat end slot opening.

Tools are made for use with either 9- or 12-gal. blower vacs or in conjuction with a factory fitted 55-gal. industrial vacuum.—*American Floor Machine Co., Toledo, Ohio.*

Circle 451 on Inquiry Card

Versatile Cleanser

Surfaces coated with grease and dirt, such as vent hoods, air filters, and fans, may be easily cleaned with a new liquid detergent.

Called CalClean, it contains surfactants, grease solvents, alkaline cleaners, corrosion inhibitors, and water conditioners. Applied as a water solution, it should remain in contact with dirty surfaces for 5 min., then be flushed with water.

The cleaner is most effective when applied with a compressed air sprayer.—*Calgon Co., Pittsburgh, Pa.*

Circle 452 on Inquiry Card

Sanitary Wall Coating

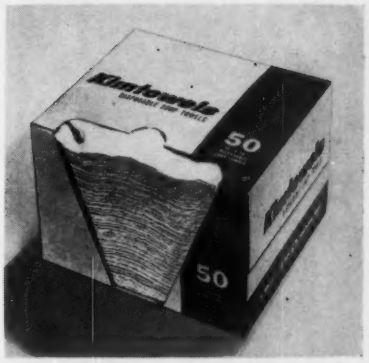
Offering a sanitary, easy-to-clean surface for porous walls is a new monolithic epoxy coating material.

Known as "Tile-X," the ceramic-like product is easily applied over concrete block, brick, plaster, haydite, and wood. No skilled labor is required to apply the high-density material, which eliminates all dirt-absorbing pores and recesses in the wall surface. The coating produces a tile-like gloss that is called typical of more expensive construction.

Moreover, the thermo - setting coating resists the destructive effects of chemicals, steam, and daily cleaning. And its fungistatic properties guard against wall deterioration by microorganisms.

Product is available in attractive solid colors and in web effects.—*Steelcote Mfg. Co., St. Louis.*

Circle 453 on Inquiry Card



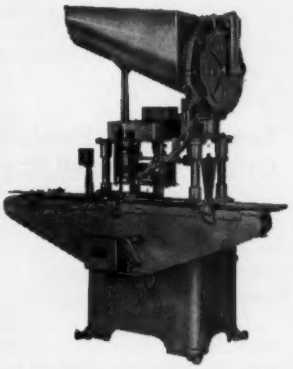
Heavy-Duty Paper Towels

Cited as the first 'reusable' and disposable shop towel, this product reportedly costs only half as much for rags or the laundering of cloth towels.

Known as Kimtowels, they are said to be lint-free and of high tensile strength. Moreover, they have three times the absorbency of rags. Applications include the many cleaning jobs for which cloth towels and rags are customarily used.—*Kimberly-Clark Corp., Neenah, Wis.*

Circle 454 on Inquiry Card

RESINA
fully automatic
SCREW CAPPER

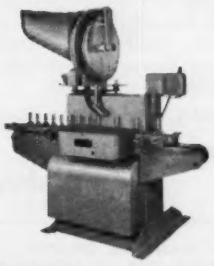


The RESINA line of CAPPERS include models for sorting, feeding and applying a great variety of caps to bottles, jars or cans from ½ ounce to gallons. Speeds available up to 120 per minute.

TOPS

THEM ALL

fully automatic
FITMENT APPLICATOR



Automatically selects plastic fitments (solid or perforated) with or without lift tabs and orients them into a chute. Passing container picks up fitment which is then snapped on the container. Speeds available up to 120 per minute or higher.

Descriptive literature and specifications on request.

RESINA AUTOMATIC MACHINERY COMPANY, INC.
572 SMITH STREET • BROOKLYN 31, NEW YORK

Now, with Avcold, you can meet the new frozen-food codes

(You get unitized loading, too!)

Meets AFDOUS standards. Keeps 1500 lbs. or 39 cu. ft. frozen for hours, from storage to retailer, without refrigeration or dry ice.

Easy to handle. Lifts with handjack or forktruck. **Rugged construction.** Steel, aluminum, foamed-in-place polyurethane insulation. 40" x 40" x 65".

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Avco/Nashville

AVCOLD, NASHVILLE DIVISION
AVCO CORP., BOX 6-3, NASHVILLE, TENN.

Please send complete Avcold information.

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Address_____

City_____ State_____

Firm_____

Title_____

Food Ingredients & Additives

Announce FDA-Certified Black Food Color

Of interest to food processors, particularly confectioners, is an FDA-certified black coloring.

Called "Midnight Black Shade," the product is a mixture of FD&C primary colors, is water-soluble, and said to be a true black. Previously available certified black food colorings have had a green, purple, or brown hue, according to the manufacturer.

On the other hand, highly purified carbon provides a true black, but is insoluble, and lacks the protection of US certification.—*Bates Chemical Co., Lansdowne, Pa.*

Circle 464 on Inquiry Card

Food-Grade Fumaric Acid

In purified form, fumaric acid serves as a food acidulent, preservative, and antioxidant synergist.

When combined with equal parts of sodium benzoate and frozen into ice, the product exhibits useful bacteriostatic and fungistatic properties. Preservation of fresh vegetables and fish is a typical application.

In combination with antioxidants, such a propyl gallate, fumaric acid helps to stabilize edible fats and oils against rancidity.—*Heyden Newport Chemical Corp., New York City.*

Circle 465 on Inquiry Card

Baked-Goods Emulsifier Offers Cell-Wall Control

An improved, vegetable emulsifier for all yeast-raised baked goods helps bread retain its as-baked, fresh softness while providing finer, more uniform grain.

Known as Atmul 651, the 'mono' ingredient exercises cell-wall control to overcome certain factors in softeners responsible for open grain, poor texture, sagging side walls, and reduced volume. This permits gluten to extend to the thinnest possible cell wall that is strong enough to contain fermentation gases.

As a result, the product reportedly gives bakers a relaxed, extensible dough that is dry and easy to work. Additional advantages cited: A symmetrical loaf with straight side walls and no sagging, greater volume or shorter proofing time, and less shrinkage in cooling racks.

The emulsifier may be added at the sponge or dough stage and needs no premixing or blending with other materials. No changes in formulation or fermentation time are required. — *R. T. Banderbilt Co., New York City.*

Circle 466 on Inquiry Card

Cite Freeze-Thaw Stability of Modified Starch

Called particularly suited for frozen foods is a modified waxy maize food starch with excellent freeze-thaw stability and resistance to low-temperature storage conditions.

Product (Col-Flo 67) is available in three grades—powdered, pearl, and sterilized-powder. The latter grade meets NCA standards for thermophilic bacteria.

The starch is especially recommended for use in acid foods, since it resists breakdown at low pH and does not set to a gel. Eye appeal of the finished product is improved by clarity, sheen, and smooth texture of the starch.—*National Starch & Chemical Corp., New York City.*

Circle 467 on Inquiry Card

All-Vegetable Emulsifier extends shelf-life of breads and yeast-raised doughs. Product (Fax) also acts as a dough conditioner and increases tenderness of the goods.—Caravan Products Co., Passaic, N. J.

Circle 468 on Inquiry Card

Properties of organic acids and anhydrides, such as acetic, butyric, and sorbic, are described in a new booklet. Comprehensive data include: Physical properties; constant-boiling mixtures; specification limits; storage, handling, and shipping procedures; toxicological properties, and literature references.—Union Carbide Chemicals Co., New York City.

Circle 469 on Inquiry Card

. . . first in Pouch Packaging

fmc announces the

STOKESWRAP "1000"

the completely new pouch-forming, filling and sealing machine with almost unbelievable versatility!

From FMC—who introduced pouch-packaging equipment and developed Stokeswrap, the standard of the industry — now comes the new "1000," a double-tube machine with all the advantages of two single-tube machines, but at less cost. The many new design features of the "1000" give the equipment an amazing flexibility that makes it ideal for large and small plants alike.

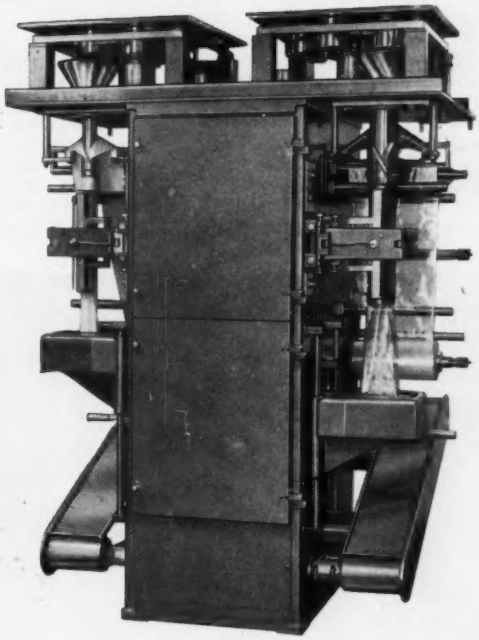
In addition to including all the proven Stokeswrap features for packaging free-flowing products such as frozen foods or candies, the "1000" has been designed to be the most versatile pouch-making machine available.

The amazing versatility of the "1000" is due to the separate drives that make it possible to operate either of the two tubes independently of the other.

The "1000" can simultaneously . . . run two different types of film . . . in two different sizes . . . with two different products . . . by means of two different feeds . . . with two different types of sealing method . . . and two different types of pouch . . . at two different speeds.

Further, production is continuous. If one side is shut down for changeover or maintenance, the other side continues to operate. And the "1000" can be purchased as a single-tube unit and the second tube added later, all at less cost than separate units.

PLUS ALL THESE FEATURES—Speeds up to 150 packages per minute. Sizes from 2" x 3" up to 8" x 14½" (with 200 cu. in. of product). New plug-in sealing mechanisms for quick change of sealing method. Side-mounted filling tubes and web rolls for easy "threading" and accessibility to moving parts. Practically every type of heat-sealable film, paper, foil or laminate. Quickly adjustable volumetric pocket capacities. Much less floorspace than two single-tube units. Waterproof filling mechanism for steam cleaning and washing down. And all with complete flexibility of operation.



Write today for complete details and specifications on the versatile new STOKESWRAP "1000."

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
FMC Packaging Machinery Division
Stokes & Smith Plant
4914 SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

NEW DESIGN AIR CLEANERS SPEED OUTPUT AT KRAFT

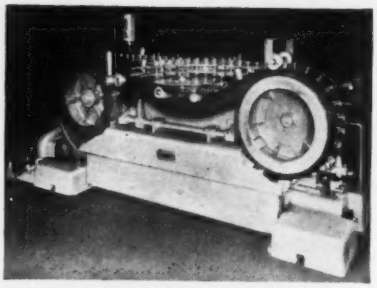
- "Sausage" type Neoprene tubes do trick
- Kraft among first to convert

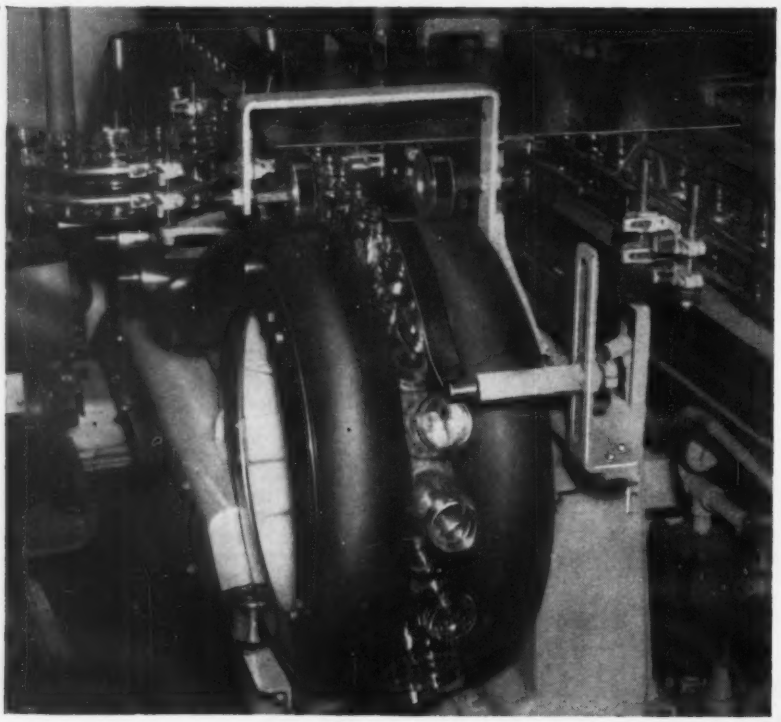
Kraft Food's Miracle Whip and Miracle French Dressing are as well known and as widely used by American housewives as their favorite brand of cosmetics. In the business world Kraft, a division of National Dairy Products Corp., enjoys a reputation as one of the nation's most able producers and merchandisers of food products.

Part, at least, of the KRAFT success is in its willingness to venture into the realm of new departures from old production principles. Pneumatic's revolutionary PNEUMACLEAN Air Cleaner is an example. Employing a never before used method of container handling—continuous air inflated Neoprene tubes—it cushions the jars or bottles gently while it inverts them, holds them firmly and moves them with record speed through the process of jet air cleaning. KRAFT quickly saw the advantages, installed the equipment and is now reaping the benefits in terms of much faster delivery of cleaned containers — 270 or more per minute.

KRAFT, a long time advocate of Pneumatic "lower cost per container" operation also uses Pneumatic equipment for filling, capping and, to considerable extent, labeling these containers.

When you're looking for the latest method of doing an automatic, or semi-automatic, packaging or bottling job look the way the leading producers in all fields do—to Pneumatic.





KRAFT runs both its wide mouth salad dressing jars as well as its narrow neck containers for a variety of sauces and dressings through its Pneumaclean units with equal facility.

PNEUMATIC SCALE CORP., LTD., 91 Newport Avenue, Quincy 71, Mass. *Sales Offices: New York; Chicago; Dallas; Rochester. Agents: Fred Todt Company at Los Angeles, San Francisco and Seattle; Rockwell Pneumatic Scale Ltd., Edgware Road, London, N.W. 2, England; O.R.M.A., Paris 8, France. Subsidiaries: Delamere & Williams Co., Ltd., Toronto; Carbert Mfg. Co., Inc., Cambridge, Mass.*

PNEUMATIC

PLANT ENGINEERING

PILLOW BLOCKS. Introduces new unit series with self-aligning, single row, deep groove, precision ball bearings. 4p.—Link-Belt Co., Chicago. **(211)**

CRADLE-MOUNTED PUMPS. Provides illustrations and specs of new line of three models that range to 1000 gal./min. and heads to 240 ft. 8p.—Ingersoll-Rand Co., NYC. **(212)**

FLEXIBLE METAL HOSE. Provides data to aid engineer in selecting proper unit and design it into each specific installation. 32p.—Atlantic Metal Hose Co., NYC. **(213)**

STAINLESS STEEL PIPE FITTINGS. Illustrates and describes wide variety of units, forged, cast, or machined from bar stock, for service from 150 to 6000 psi. 36p.—Cooper Alloy Corp., Hillside, N. J. **(214)**

PRESSURE REGULATORS. Details differential type units for control of atomizing steam pressure at adjusted value higher or lower than fuel oil pressure. 2p.—Atlas Valve Co., Newark, N. J. **(215)**

GLASS-RESIN TANKS. Outlines features of corrosion-resistant units in capacities of 4600, 8500, 1200, and 1600 gals., including applications for each. 6p.—Black, Sivalls & Bryson Inc., Kansas City, Mo. **(216)**

MOTOR APPLICATION. Describes broad line of single phase, three phase, and direct current types, including gearmotors and speed drives, with comprehensive application chart. 16p.—Century Electric Co., St. Louis, Mo. **(217)**

VALVES & FITTINGS. Provides technical data, illustrations, and schematic diagrams of high pressure, corrosive resistant units, including list prices for each.—Dragon Engineering Co., Norwalk, Calif. **(218)**

HYDRAULIC SEALS & PACKINGS. Describes and illustrates various types, sizes, operating features and advantages of a complete line of solid urethane types. 7p.—Disogrin Industries, Mt. Vernon, N. Y. **(219)**

CONTROL VALVES. Details complete line, available for 1500 psi pneumatic and hydraulic service and −40F to +250F temp range. 8p.—Ledeen Inc., El Monte, Calif. **(220)**

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WEIGHING FEEDER. Provides specs and illustrations on rugged, compact, completely automatic unit that feeds two cu. ft./min. over a 100:1 range with accuracy of ±1% of set feed rate. 4p.—B-I-F Industries, Providence, R. I. **(225)**

KETTLES. Data, including detailed specs, is presented on following types: stationary, trunnion-mounted; trunnion-mounted with worm or hydraulic lift; pressure; and pressure cookers. 4p.—Lee Metal Products Co. Inc., Philipsburg, Pa. **(226)**

DRY HOMOGENIZING. Details advantages of centrifugal action for mixing, dispersion, and dry homogenization, including construction and performance specs of three basic mixer models. 4p.—Entoleter Inc., New Haven, Conn. **(227)**

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STRETCH PACKAGING. Details new high-speed unit offering complete operation on one machine at one time. 4p.—Downingtown Paper Co., Downingtown, Pa. **(239)**

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PLASTIC-COATED PAPER. File folder contains variety of samples, including pouch paper, blotter paper, gold metallic, and several krafts.—The Marvellum Co., Holyoke, Mass. **(241)**

CORRUGATED SHIPPING CONTAINERS. Describes broad range of basic designs in individual detail to aid in selection of proper types geared to product requirements. 34p.—Olin Mathieson Chemical Corp., West Monroe, La. **(242)**

GLASS CONTAINERS. Traces, in graphic form, the evolution of a glass container from raw materials into finished product by modern production methods. 32p.—Glass Container Manufacturers Institute, NYC. **(243)**

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SANITATION & MAINTENANCE

EPOXY WALL COATING. Details functions and specs of new surface to sanitize and beautify concrete block and other porous wall surfaces.—Steelcote Mfg. Co., St. Louis, Mo. **(251)**

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SALT. Series of six brochures outline ingredient's advantages in butter & cheese, fat-containing foods, surface salting of baked goods, prepared flours and mixes, processed meats, and brine making.—Diamond Crystal Salt Co., St. Clair, Mich. **(261)**

PROTEINS. Describes new low cost enzymatically hydrolized yeast, casein, and soy protein used as fermentation nutrients and for other manufacturing purposes.—Amber Laboratories Inc., Milwaukee, Wis. **(262)**

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MARKETING

CONSUMER ANALYSIS. Up-to-date listing of brand preferences of some 80 food-beverage products in Seattle trading area also tabulates product by income groups. 114p.—Seattle Times, Seattle, Wash. **(291)**

MEDIA INFORMATION. Brochure on newspapers includes basic data on variety of subjects, including costs, teen-agers' reading habits, seasonal trends, etc. 27p.—American Newspaper Publishers Assn., NYC. **(292)**

PRODUCT MARKET. Fact-filled report on coffee market covers consumption, regional trends, potential new outlets, packaging, and future outlook. 19p.—Curtis Publishing Co., Philadelphia. **(293)**

MARKETING CHANNELS. Details checkpoints to make sure that your distribution pipelines are not outdated by changing conditions. 4p.—Small Business Administration, Washington, D.C. **(295)**

MANAGEMENT

PERSONNEL PSYCHOLOGICAL TESTING. Describes methods of minimizing error in personnel selection and executive promotion through testing methods.—The Personnel Psychology Center, NYC. **(301)**

TRUCK FLEETS: LEASE OR BUY? Analyzes merits and demerits of truck fleet leasing plans against company ownership, including data from new survey covering practices of over 4,500 firms. 32p.—Foundation for Management Research, Chicago. **(302)**

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	Type 18-00	Type 18-07	Type 18-40	Type 18-85
Source material	Fully hydrogenated lard	Fully hydrogenated cottonseed oil	Prime steam lard	Refined cottonseed oil
Monoester content (min.)	90.0%	90.0%	90.0%	90.0%
Saponification value	155-165	155-165	155-165	155-165
Iodine value	1	1.0 (max.)	50 (approx.)	85 (approx.)
Glycerol content (max.)	1.0%	1.0%	1.0%	1.0%
F.F.A. (max.): as stearic as oleic	1.5%	1.5%	1.5%	1.5%
Specific gravity	0.91 at 80°C	0.91 at 80°C	0.92 at 80°C	0.93 at 80°C
Congeal point (approx.)	68°C	67°C	47°C	46°C
Clear point (approx.)	73°C	76°C	60°C	56°C
Form	Bead	Bead	Plastic homogenized fat	Plastic homogenized fat
Net shipping weight, lb.	250	250	400	400

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Myverol Distilled Monoglycerides are bland, stable, and free from catalysts and soaps. There is nothing in them that might affect taste, color, or odor. To learn which of them might improve your control of food texture, write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

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Useful New Books

Paperwork Costs Cut

PAPERWORK MANAGEMENT *by John H. Ross. Office Research Institute, P.O. Box 744, South Miami, Fla. 300p. 1961. Price: $20.00.*

In this one volume practical manual are the techniques, forms, procedures, and job descriptions you need to reduce and control paperwork costs in your organization—large or small. Volume not only shows "What" and "Why" but "How." Any practical person with experience in office routines can do the job with this book as a guide. Volume is instructive and interesting to read, not written in repelling encyclopedia or textbook style.

Thermal Processing

THE THERMAL PROCESSING OF FOODS *by S. A. Goldblith, M. A. Joslyn, and J. T. R. Nickerson. The AVI Publishing Co., P.O. Box 388, Westport, Conn. 1961. 1260p. Price: $16.50.*

This is the first volume of an anthology on food technology selected and collected by eminently qualified men. It deals mainly with canning. Here are the best, most significant contributions to the field from its earliest development to the very latest practice. In one place may be found classical milestones, the very meat of progress. Many of the original papers are out of print or difficult of access and the editors have made a valuable contribution in selecting important landmarks and bringing them together in one compact volume.

Management Simulation

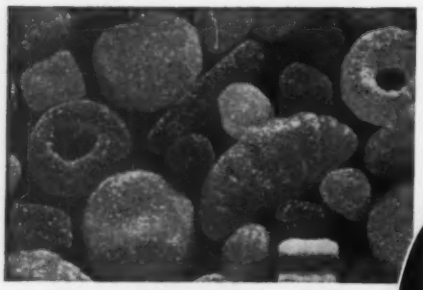
SIMULATION AND GAMING: A SYMPOSIUM *by Andrews M. Lang. American Management Assn., 1515 Broadway, Times Square, N. Y. 1961. 136p. Price: $2.50 (members); $3.75 (non-members).*

Presents a frank discussion of the pros and cons of management decision simulation, first introduced by AMA in '57. A major advantage of business simulation, or games, is described as a powerful "illusion of reality"; "the deep emotional involvement" games almost invariably produce among the players. "Players have to live with the consequences of their decisions, and they are able to go back and test alternative strategies." The games are described as "living" or "dynamic" case studies.

Booklets & Reports

EFFECTS OF DELAYED INITIAL SALTING ON TRANSIT TEMPERATURES OF CALIFORNIA LETTUCE SHIPPED BY RAIL. *USDA, Agricultural Marketing Service, Market Quality Research Div., Washington, D. C. (Report No. AMS-433). 8p.* Details results of air and lettuce temperatures, including illustrative graphs.

HOW TO BUY MILITARY SURPLUS PROPERTY. *U. S. Govt. Printing Office, Washington 25, D.C. 26p. Price: 15¢.* Explains how to buy military surplus property.



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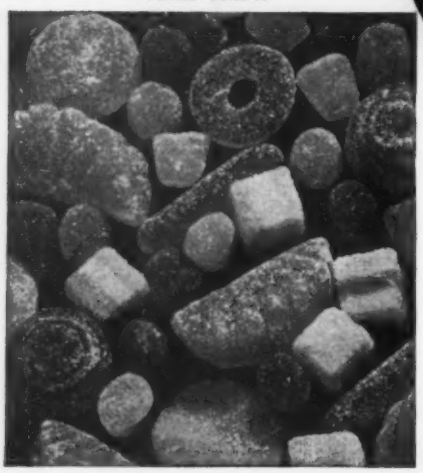

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- Improves spreadability of jams, jellies and preserves.
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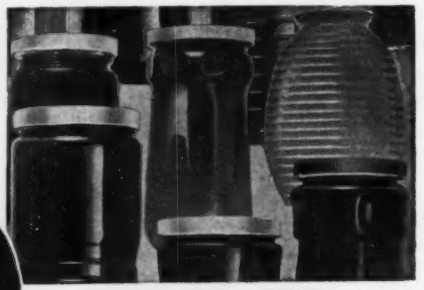

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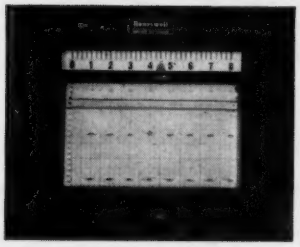

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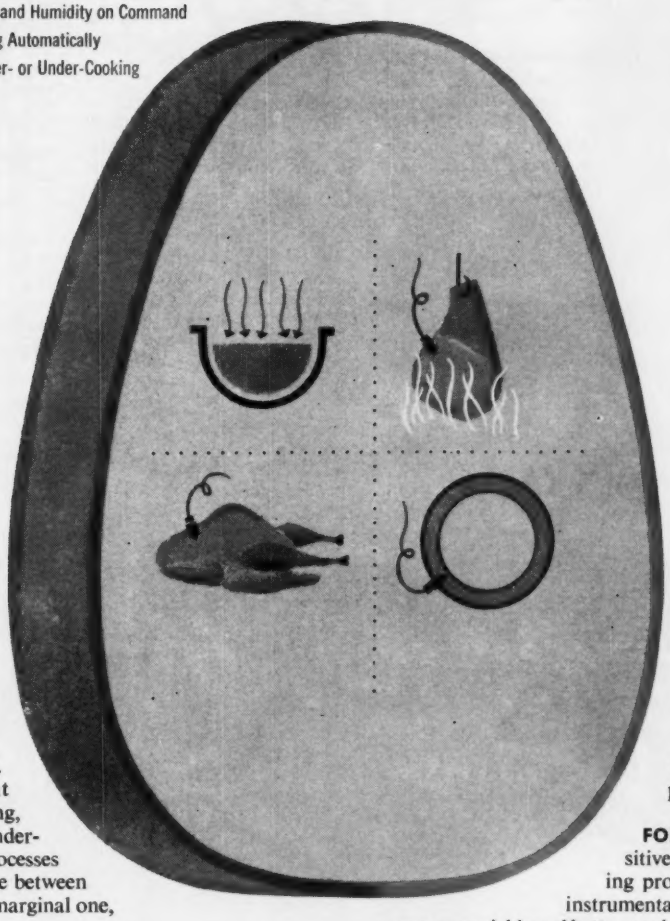

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Dehydrated Fruit Having Characteristics of Sun-Dried Fruit.—M. E. Lazar, USDA. No. 2,979,412.

Sweetened Cream - Nonfat Milk Solids Mixture With Sugar-Plus-Water Ratio of About 60-65%.—A. Tamsma, USDA. No. 2,981,626.

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Machine for Forming Multipocket Packages and Filling Product Into Pockets.—R. G. Price, Thomas Lipton, Hoboken, N. J. No. 2,978,-853.

Heat - Shrinkable Oriented Film With One Lamination Containing Fungicide. — A. K. Parlour, Tee-Pak, Chicago. No. 2,979,410.

Dual Product- and Erected Carton - Conveyor System for Inserting Products Into Cartons.—R. K. Galloway, Food Machinery & Chemical, San Jose, Calif. No. 2,-979,873.

PROCESSING

Employing Ultrasonic Technique To Tenderize Meats.—W. F. Hagen, Union Stock Yard & Transit Co. of Chicago. No. 2,980,537.

Producing Firm Curd by Mixing Acidogen With Milk Before Start of Curd Formation.—E. G. Hammond, Iowa State College Research Foundation, Ames, Ia. No. 2,982,654.

Controlling Removal Rate of Column-Confined Curd To Produce Cheese of Required Body, Texture, Acidity and Moisture.—R. T. Budd, National Research Development Corp., London, Eng. No. 2,982,655.

Coloring Foods by Contacting Them With Alkali Metal Salt of Curcumin That's Acid-Liberated From Its Alkali Metal Salt.—E. E. Langenau, Fritzsche Bros., N.Y.C. No. 2,982,656.

Lactic Acid Fermenting and Pasteurizing Vegetable Juices To Extend Shelf-Life. — Fritz-Gunther Keitel, Hamburg, Ger.—No. 2,-982,657.

Pressure - Forming Cheese Into Semi-Cylindrical Consumer-Size Cuts. — O. R. Thompson, Armour & Co., Chicago. No. 2,982,661.

EQUIPMENT

Pear Peeler Comprising Rotary Turret, Gear - Driven Impaling Tube and Rotary Cutter.—S. H. Creed, Food Machinery & Chemical, San Jose, Calif. No. 2,979,093.

Cucumber Puncturing Machine With Rotating Prickling Member.—H. J. Tokimoto, Chicago. No. 2,979,-094.

Machine for Tearing English Muffins. — A. Jovis, N.Y.C. No. 2,979,095.

Continuous Tomato Peeler With Radiant Heating and Air - Blower Type Cooling Sections. — G. H. Rogers, Richmond-Chase Co., San Jose, Calif. No. 2,979,097.

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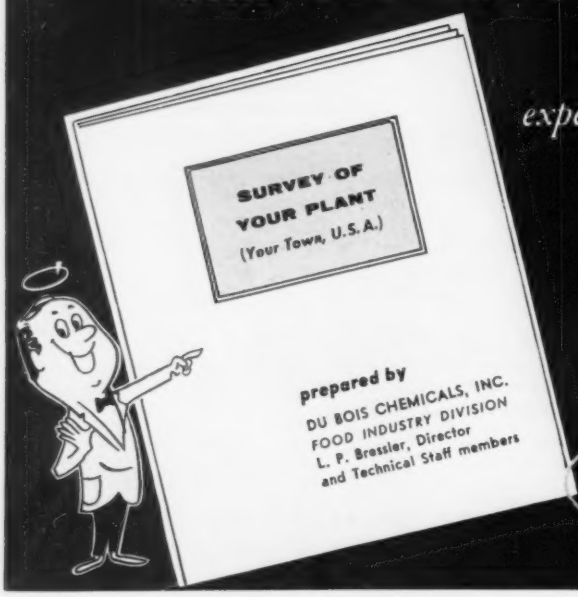

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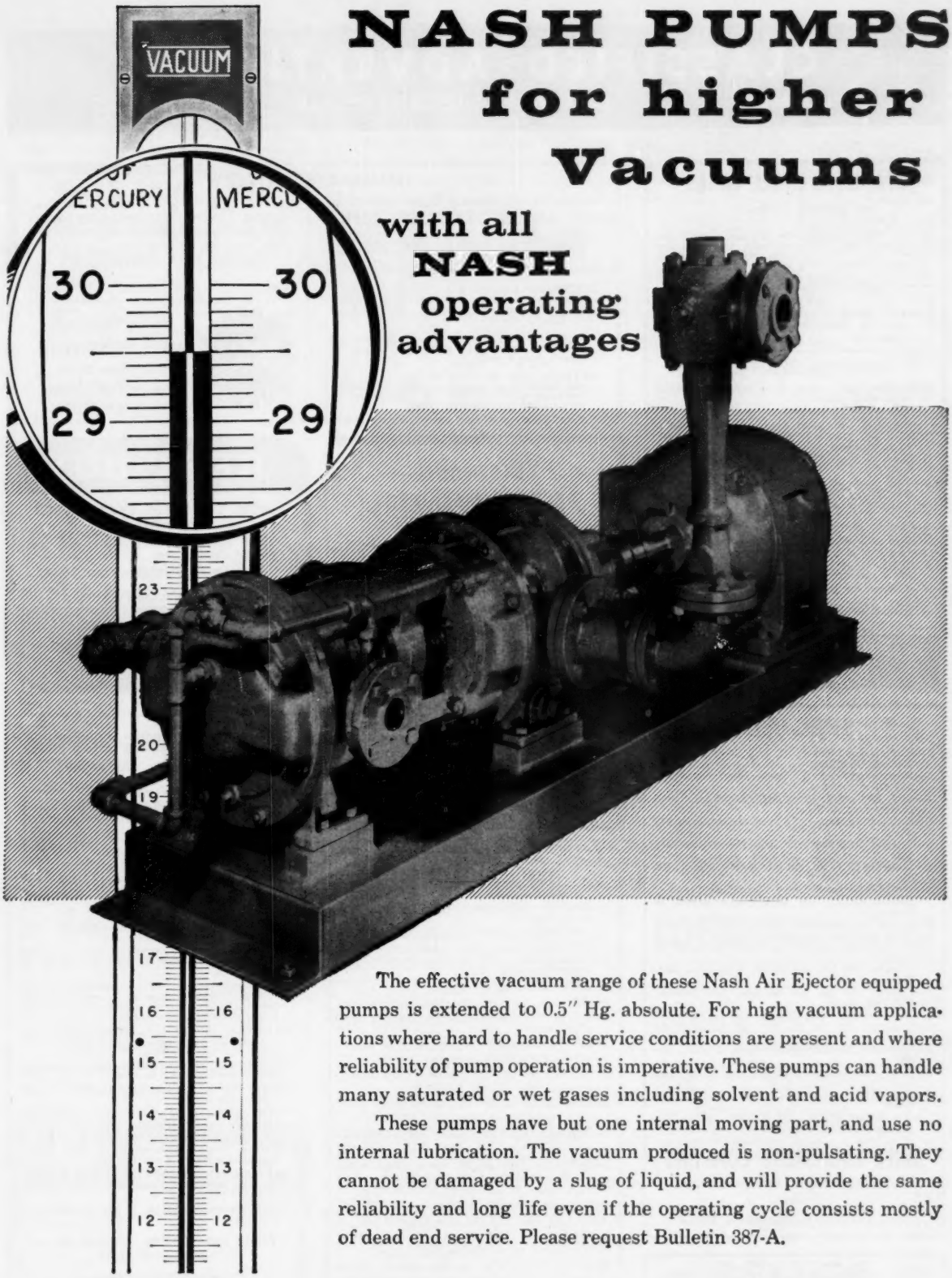

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Extensive Experience in All Branches of the Food Industry, Including Production, Quality Control, Development of New Products, Advice Regarding Equipment, Laboratory and Plant Layouts, and Training of Personnel.
YOUNG'S RESEARCH AND TECHNICAL INSTITUTE
Suite 306 755 Avenue Road
Toronto 7, Ontario, Canada

Specialized Engineering Service
***for* FOOD PROCESSING INDUSTRY**
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80 FEDERAL STREET
BOSTON, MASSACHUSETTS
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☐ Food Technology
☐ Pharmacology for your Business
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West Coast Specialists in Food Plant & Process Design, Experimental Machine Shop for Prototype Development, Dehydration and Freeze Processing Consultants.
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Laboratory Services
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SCHWARZ LABORATORIES, Inc.
Consultation on Food Problems
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Food Plant Design and Process Improvement
Research and Investigations
Legal Testimony
Write for bulletin describing facilities and services
230 Washington St., Mount Vernon, N. Y.
Phone: MO 4-1100 Cable: Swoknip

Employment

HELP WANTED

INDUSTRIAL REFRIGERATION SALES ENGINEER
Expanding West Coast manufacturer of industrial refrigeration equipment needs graduate engineer or equivalent experience with minimum of three years' experience selling industrial refrigeration equipment to food plants, cold storage, food freezing, poultry plants, etc. Must be convinced of the potential of the industrial refrigeration industry.
Write to C. R. Kohlenberger, President
Kohlenberger Engineering Corporation,
P. O. Box 432, Fullerton, California

WANTED
Food chemist; experienced; good opportunity. All replies to be held in strict confidence. State experience, salary expected.
STUART HALE COMPANY
2529 N. PULASKI RD., CHICAGO 39, ILL.

WANTED
Food Technologist for quality control and product development work in carbonated beverage bottling. Experience or potential in production supervision desirable. In reply specify training, experience, salary requirements.
BOX FE-90
c/o FOOD ENGINEERING, Chestnut at 56th, Phila. 39

SITUATION WANTED

MANAGEMENT—Chemical Engineer, Experienced plant manager, plant-production superintendent in food, fats, oils, hydrogenation, fatty acids, soybean processing, distillery, submerged fermentations, yeast, vitamins, dry-wet grain milling, flour, corn syrup, starches, caramel coloring, chemicals. Box FE-86, c/o FOOD ENGINEERING, Chestnut at 56th. Phila. 39.

FOOD Engineering Chestnut 56th Sts., Philadelphia 39, Pa.

Please send me rates and general information about the Classified Section without obligation on my part.

Name ..... Title .....

Company .....

Street .....

City ..... Zone ..... State .....

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give your product

Dried Torula Yeast, a low cost nutritional ingredient can boost the value of your product. Whether you want to restore nutrients lost in processing, standardize vitamin content, or increase protein above present levels, Torula Yeast can do the job economically.

Lake States Torula Yeast is 50% protein. Here is a reliable source of the amino acids, B vitamin complex factors, lysine, and essential minerals.

Torula Yeast is bland, it blends well, and is remarkably stable and uniform for long shelf life. It is primary grown in sterile media.

Hickory Smoked Bakon Yeast adds sales appeal to almost any food product by contributing a unique smoked flavor. Foods are more zestful and exciting with Bakon Yeast. And Bakon contains no salt, starch, sugar, or meat.

As a 100% hickory-smoked Torula Yeast, Bakon provides all the nutritional values of Torula. For flavor *and* nutrition, many food processors and meat packers have turned to Bakon Yeast.

Samples—Write today for complete information and liberal test sample of either or both of these unique products. Please state your intended application.

Lake States

LAKE STATES YEAST AND CHEMICAL DIVISION OF ST. REGIS PAPER COMPANY RHINELANDER, WISCONSIN

Sales Office: 420 Lexington Ave., New York 17, N.Y.; or W. Glenn Wunderly Company, 232 North Lake Ave., Pasadena, California; Kempsell Associates, P. O. Box 27, Garland (Dallas), Texas; Dillons Chemical Company, Ltd., Montreal and Toronto, Canada.

Our big three in cartons meet everyday at Olin

The big three in cartons are the graphic designers, the structural designers and the printers. Olin has made them even more important by bringing them together under one roof. The continual interchange of ideas possible at the Olin Carton Service not only produces better cartons, it avoids any of the many mistakes that can happen when Creative is three states away from Structural, and Printing is in another time zone.

The cartons turned out by Olin's centralized (and talented) staff are made of Omnikote, the strongest board in the industry. They are printed by one of the most advanced printing establishments in the world. And they are graphically designed to do the job of flagging down the nearsighted housewife who's left her glasses home. So if you're having trouble with cartons, tell us about it. Olin's big three probably have the answer.

PACKAGING DIVISION Olin

FOREST PRODUCTS OPERATIONS, P.O. BOX 1225, WEST MONROE, LA.

CIRCLE 110 ON INQUIRY CARD

FOOD ENGINEERING

READER INQUIRY SERVICE

FREE . . . to you! Cost-cutting, profit-making information.

Facts about equipment, ingredients, packages, supplies and services described or advertised in this issue are easily available to you through this section.

Numbers on back of each tear-out post card correspond to the key numbers on equipment, package, ingredient, sanitation, supply, or service items, and to advertisements.

It's easy. All you do is . . .

Select . . . items that interest you as you read this issue. All items are conveniently named in two lists on the following three pages. First list is alphabetically arranged by name of manufacturer or supplier. Second is alphabetical by product or service category.

Then . . .

Circle . . . number of each item you want on the back of one of the post cards.

Write . . . your name, title, company, and address in space provided on card.

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Use of inquiry cards restricted to those with buying authority or responsibility in food manufacturing.

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PHILA. 39, PA.

BUSINESS REPLY MAIL
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POSTAGE WILL BE PAID BY
FOOD Engineering

The Computer Center
P.O. Box 7572, Philadelphia 4, Pa.

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Circle corresponding numbers at left on Inquiry Card

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Sheeter tables, details.

24 **Angelus Sanitary Can Machine Co.**
Can closing machines, details.

96 **Avco Corp.**
Refrigeration, information.

64 **Chemetron Corp.**
Heat transfer units, data.

42 **Cherry Burrell Corp.**
Freezing units, information.

93 **Corn Products Co.**
Corn products, data.

56 **Dicalite.**
Filter aids, literature.

101 **Distillation Products Industries.**
Monoglycerides, information.

73 **Dodge & Olcott.**
Seasonings, brochure.

104 **DuBois Chemicals.**
Cleaning chemicals.

30 **Ekco-Alcoa Containers.**
Packaging equipment, specification sheets.

53 **Firmenich.**
Flavors.

6 **Food Machinery & Chemical Corp.**
Bean snipper, literature.

97 **Food Machinery & Chemical Corp.**
Pouch packaging machine, details, specifications.

5 **Gas Atmospheres.**
Gas packaging units, information.

47 **Genisco.**
Transistorized conveyor controls.

12 **Goodrich Industrial Products Co.**
Pipes, fittings, booklet.

20 **Grinnell Co.**
Diaphragm valves, information.

66 **Hercules Powder Co.**
Vegetable protein, data sheet, sample.

100 **A. E. Illes Co.**
Flavors, information.

2 **Illumitronic Systems Corp.**
Weighing, information.

116 **International Flavors & Fragrances.**
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78 **Johns-Manville.**
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9 **Kraft Foods.**
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10 **Ladish Co.**
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109 **Lake States Yeast & Chemical Co.**
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86 **LaPorte Mat & Mfg. Co.**
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91 **Miles Chemical Co.**
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103 **Minneapolis-Honeywell.**
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84 **Morton Salt Co.**
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18 **Niagara Blower Co.**
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115 **Norda.** Flavors.

110 **Olin Mathieson.** Cartons.

50 **Owens-Illinois.**
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55 **Owens-Illinois.**
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94 **Phillips Chemical Co.**
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28 **Pulverizing Machinery Co.**
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118 **Sarco Co.**
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11 **Sargent's Sons Corp.**
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52 **Werner Machinery Co.**
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15 **Wright Machinery Co.**
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110 **Portable dehumidifier.**
Beck & Co.

Cleaning & Sanitation

98 **Air cleaners.**
Pneumatic Scale Corp.

151 **Boiler cleaning.**
American Floor Machine.

104 **Cleaning chemicals.**
DuBois Chemicals.

452 **Cleanser.**
Calgon.

255 **Dry mop cleaning.**
U. S. Hoffman Machinery Corp.

252 **Dust arresters.**
Buell Engineering Co.

338 **Dust collector.**
Pulverizing Machinery Co.

258 **Fly control.** Huge Co.

351 **Fumigant.** Degesch.

254 **Gas scrubbers.**
Sly Mfg. Co.

454 **Paper Towels.**
Kimberly-Clark.

256 **Rust freeing liquid.**
Armite Laboratories.

Name ..... Title .....

Company .....

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City ..... Zone ..... State .....

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Where ads offer more than one item, I've written key number and identity below

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AUGUST 1961

Expires Oct. 31, 1961

IMPORTANT MUST INFORMATION

Please check in A & B below best description

A—Your Function

- ☐ 1. Corp. or Admin. Mgmt.
- ☐ 2. Plant Operat. Mgmt.
- ☐ 3. Tech. or Eng. Mgmt.
- ☐ 4. Other

B—Principal Product

- ☐ 1. Baked Goods
- ☐ 2. Beverages
- ☐ 3. Confectionery
- ☐ 4. Fruits & Vegetables
- ☐ 5. Grain Products
- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods

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MAIL

Construction & Fabrication

251 **Epoxy wall coating.**
Steelcote Mfg. Co.
253 **Floor renewal compound.**
Garland Co.
453 **Wall coating.**
Steelcote Mfg. Co.

Disintegration Equipment

6 **Bean snipper.**
Food Machinery & Chemical Corp.
21 **Dicer.**
Urschel Laboratories.
407 **Mill, impact.** Entoleter.
344 **Mill, impact.**
Universal Milling & Machinery.
350 **Mill, lab-type.**
Brabender Instruments.
299 **Pulverizer, classifier.**
Bauer Brothers Co.

Electrical Equipment

217 **Motor application.**
Century Electric Co.
77 **Speed drives.**
Sterling Electric Motors.
276 **Speed systems.**
U. S. Electrical Motors.

Equipment & Truck Leasing

302 **Truck fleets.**
Management Research.

Forming Equipment

414 **Cross grain moulder-panner.**
J. H. Day Co.
209 **Molder.** Cantab Industries.

Freezing Equipment & Supplies

42 **Freezing.** Cherry-Burrell Corp.
96 **Refrigeration.**
Avco Corp.
18 **Refrigeration.**
Niagara Blower Co.

Heat Transfer Equipment

64 **Heat transfer units.**
Chemetron Corp.
228 **Heating and cooling tanks.**
Creamery Package Mfg. Co.
406 **Vacuum-cooling unit.**
McDonough Steel Co.

Ingredients & Additives

469 **Acid properties.**
Union Carbide Chemicals.
102 **Apple pectins.**
Speas Co.
464 **Black food color.**
Bates Chemical.
91 **Citric acid.**
Miles Chemical Co.
93 **Corn products.**
Corn Products Co.
466 **Emulsifier.**
R. T. Banderbilt.
468 **Emulsifier.**
Caravan Products.
16 **Enzymes.** Rohm & Haas.
53 **Flavors.** Firmenich.
100 **Flavors.** A. E. Illes Co.
116 **Flavors.**
International Flavors & Fragrances.
115 **Flavors.** Norda.
19 **Flavors.**
R. D. Webb & Co.
263 **Food starches.**
Morningstar-Paisley.
465 **Fumaric acid.**
Heyden Newport Chemical.
81 **Lemon juice.**
Sunkist Growers.
467 **Modified starch.**
National Starch & Chemical.
101 **Monoglycerides.**
Distillation Products Industries.
265 **Piperesin.**
Fritzsche Brothers.
66 **Protein, vegetable.**
Hercules Powder Co.
262 **Proteins.**
Amber Laboratories.
261 **Salt.**
Diamond Crystal Salt Co.
73 **Seasonings.**
Dodge & Olcott.
264 **Sodium pyrophosphate.**
Stauffer Chemical Co.
9 **Stabilizer.**
Kraft Foods.
109 **Yeast**
Lake States Yeast & Chemical.

Instruments, Measurement & Control

403 **Analyzer, nitrogen.**
Technicon Controls.
207 **Analyzer, oxygen.**
Beckman Instruments.
341 **Continuous tester.**
Henry Simon.
336 **Control, electronic level.**
Rolfes Electronics Corp.
4 **Controllers, temperature.**
Sarco Co.
118 **Controllers, temperature.**
Sarco Co.
47 **Controls, conveyor.**
Genisco.
277 **Controls, temperature.**
United Electric Controls Co.
84 **Dispenser, flocron.**
Morton Salt Co.
412 **Gross-weighing system.**
Thayer Scale.
413 **Indicator, continuous level.**
Electronic Machine.
103 **Instruments.**
Minneapolis-Honeywell.
28 **Monitor.**
Pulverizing Machinery.
201 **Monitors.** Hardy Scales.
416 **pH gage.**
Kel Instruments.
215 **Pressure regulators.**
Atlas Valve.
343 **Proportioning system.**
B-I-F Industries.
409 **Refractometer.**
Water Associates.
117 **Scale.** Thayer Scale.
340 **Scale, electronic.** Toledo Scale.
339 **Scale, trim-weigh.**
Bemis Brothers Bag.
418 **Spectrophotometer.**
Beckman Instruments.
417 **Titrator, automatic.**
Coleman Instruments.
2 **Weighing, automatic.**
Illumitronic Systems.
266 **Weighing systems, bulk.**
Toledo Scale.
15 **Weigher.** Wright Machinery.

Lubrication and Fuels

221 **Corrosion resistance lubrication.**
Electrofilm.

Management Services

291 **Consumer analysis.**
Seattle Times.
303 **Health checklist.**
Small Business Administration.
295 **Management aids No. 120.**
Small Business Administration.
293 **"Market for Coffee."**
Curtis Publishing.
301 **Personnel psychological testing.**
Personnel Psychology Center.
292 **"27 Nutshell Facts."**
American Newspaper Publishers Assn.

AUGUST 1961

Expires Oct. 31, 1961

CHECK→ ***Important Must Information***

IMPORTANT MUST INFORMATION

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WRITE—*name, title, company and address*

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MAIL

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- ☐ 6. Meat, Poultry, Fish
- ☐ 7. Milk & Milk Products
- ☐ 8. Sugar & Sugar Products
- ☐ 9. All Other Foods

Name ..... **Title** .....

Company .....

Address .....

City ..... **Zone** ..... **State** .....

Do you wish to receive FOOD Engineering? YES ☐ NO ☐

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461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	479	479	480

Where ads offer more than one item, I've written key number and identity below

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Materials Handling

349 Bulk handling system. Consolidated Engineering.
86 Conveyor belts, flexible steel. LaPorte Mat & Mfg.
269 Lower handling costs. Yale & Towne Mfg.
267 Pneumatic unloader, portable. Sprout, Waldron & Co.
268 Straddle stacker. Clark Equipment.
225 Weighing feeder. B-I-F Industries.

Mixing Equipment

348 Continuous blending system. B. F. Gump.
227 Dry Homogenizing. Entoleter.
402 Mixers. Mixing Equipment.
404 Storage unit and lender. A. E. Staley.

Moisture Removal Equipment

11 Dryers. C. G. Sargent's Sons.
415 Freeze dry units. Repp Industries.
72 Pre-Evaporator. Thermovac.

Packaging Equipment

337 Bag folder-closer, automatic. Oslo.
24 Can closing machine. Angelus Sanitary Can Machine.
5 Gas packaging units. Gas Atmospheres.
405 Multi-wall bag packer. St. Regis Paper.
30 Packaging equipment. Ekco-Alcoa Containers.
97 Pouch packaging machine. Food Machinery & Chemical.
95 Screw capper. Resina Automatic Machinery.

Packaging Materials

314 Cartons. American Can.
110 Cartons. Olin Mathieson.
316 Cellophane bags. Milprint.
50 Corrugated boxes. Owens-Illinois.
317 Glass bottles, flint. Continental Can.
243 Glass containers. Glass Containers Manufacturers Institute.
312 Hygrade package design. Lord Baltimore Press.
55 Institutional containers. Owens-Illinois.
315 Jam label. Frazer Label.
94 Marlex boxes, trays, flats. Phillips Chemical.
241 Paper, plastic-coated. Marvellum.
319 Polyethylene coated film. Olin Mathieson Chemical.
321 Polyethylene polymers. Avi Sun.
25 Pouch pack. Riegel Paper.
313 Reclosable bacon carton. DuPont de Nemours.
311 Shrinkable film for multi packs. Reynolds Metals.
239 Stretch packaging. Downington Paper.
240 Tapes, pressure sensitive. Topflight.
318 Triethylene glycol. Dow Chemical.
80 Vegetable parchment. West Carrollton Parchment.

Pipes, Valves, Tubing, Spray Nozzles

411 Butterfly valves. Lukenheimer Co.
220 Control valves. Ledeen.
20 Diaphragm valves. Grinnell.
213 Flexible metal hose. Atlantic Metal Hose.
88 Hoses and fixtures. Strahman Valves.
12 Pipes & fittings. B. F. Goodrich.
401 Sanitary rubber tubing. W. S. Shamban.
230 Spray drying nozzles. Spraying Systems.
214 Stainless steel pipe fittings. Cooper Alloy.
218 Valves & fittings. Dragon Engineering.
408 Valve positioner. Taylor Instrument.

Plant Services

257 Bird repeller. Trippe Manufacturing.
216 Glass-resin tanks. Black Sivalls & Bryson.
219 Hydraulic seals & packings. Disogrin Industries.
202 Rubberized fabric tank. Goodyear Tire & Rubber.
259 Rust prevention. Sudbury Laboratory.

Plant Site

69 Plant location. Toledo Edison.

Power Transmission Equipment (Mechanical)

222 Flexible cushion couplings. Dodge Manufacturing.
211 Pillow blocks. Link-Belt.
208 Self lubricating chain drive. Hewitt-Robins.

Processing Equipment (Heat)

52 Baking equipment. Werner Machinery.
225 Kettles. Lee Metal Products.
92 Sheeter tables, production fryers. Anetsberger Brothers.

Pumps and Air Compressors

10 Centrifugal pump. Ladish.
212 Cradle-mounted pumps Ingersoll-Rand.

Separation Equipment (Dry)

345 All metal purifier. Simco-Morros.
346 Double purifier. MIAG.
342 Vibrating air column unit. Allen Bradley.
347 Vibration-free screen. Fred Forsberg & Sons.

Separation Equipment (Wet)

14 Centrifuge. Pfaudler Permutit.
232 De-sludgers. Centrico.
56 Filter aids. Great Lakes Carbon.
78 Filtration. Johns-Manville.
231 Proportioning liquids to solids. B-I-F Industries.

Shipping Containers

205 Bulk containers. Tote Systems.
242 Corrugated shipping containers. Olin Mathieson Chemical.

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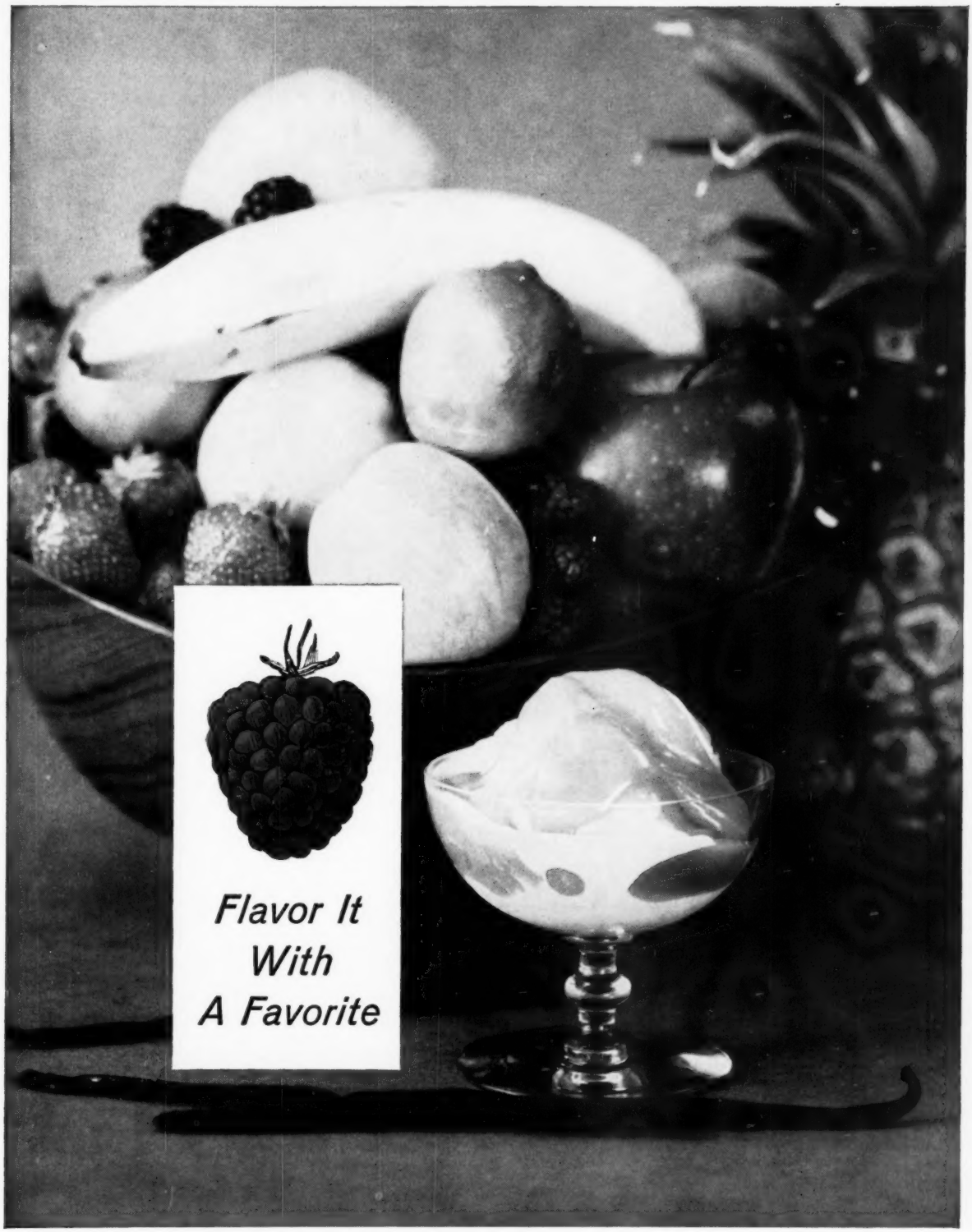

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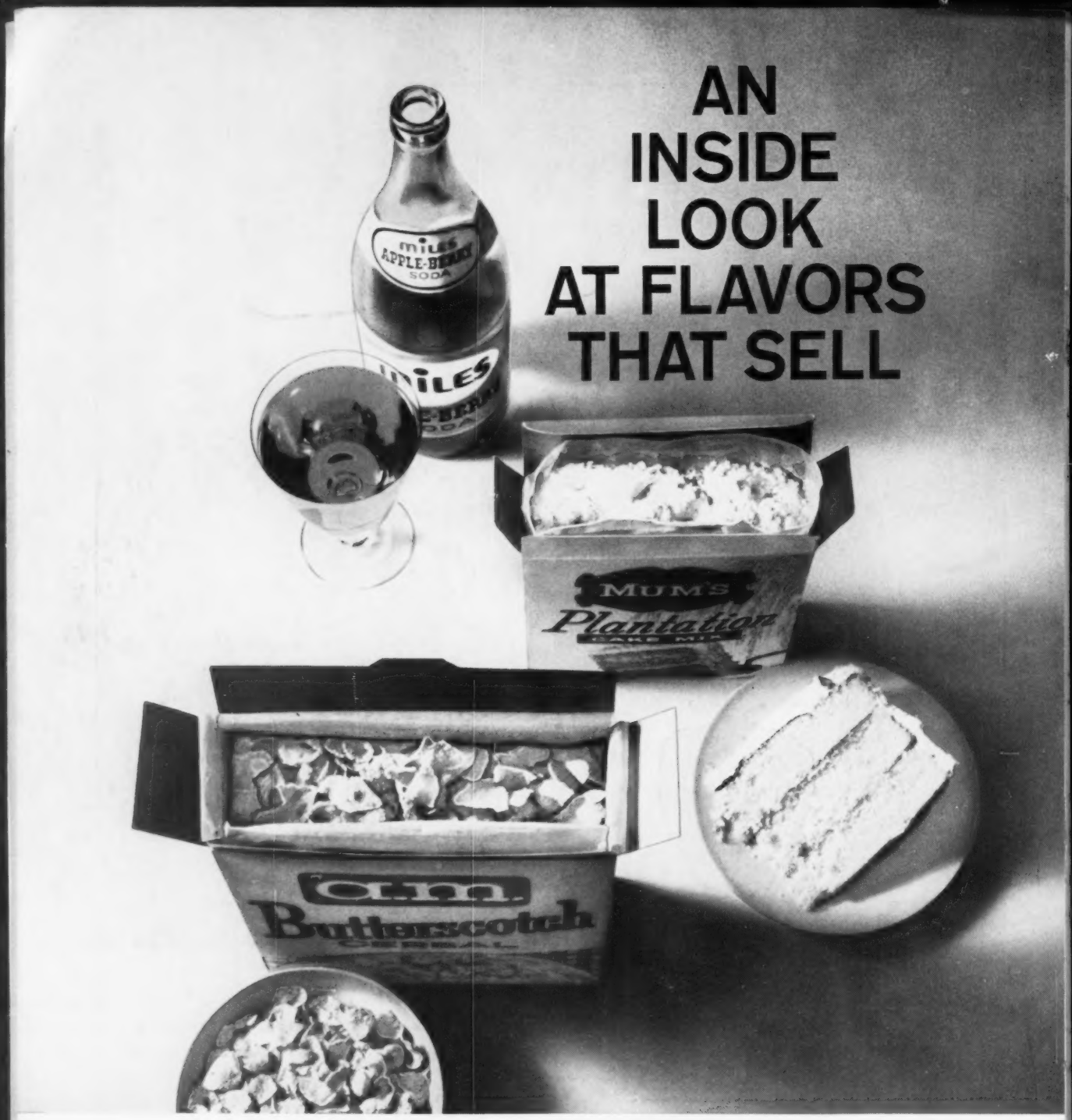

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